August 9, 1974 16

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GOVERNMENT REPORTS ANNOUNCEMENTS

Volume 74, Number 16 ◆◆◆ August 9, 1974

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INDEXES. Corporate Author, Subject, Personal Author, Contract Number, and Accession/Report Number Indexes are published in the corresponding issue of Government Reports Index (GRI).

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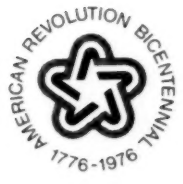

INTRODUCTION

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SUBJECT FIELD AND GROUP STRUCTURE

(Use Edge Index on back cover to locate subject field in the journal)

FIELD 1. AERONAUTICS. Includes the following Groups: Aerodynamics; Aeronautics; Aircraft; Aircraft Flight Control and Instrumentation; Air Facilities.

FIELD 2. AGRICULTURE. Includes the following Groups: Agricultural Chemistry; Agricultural Economics; Agricultural Engineering; Agronomy and Horticulture; Animal Husbandry; Forestry.

FIELD 3. ASTRONOMY AND ASTROPHYSICS. Includes the following Groups: Astronomy; Astrophysics; Celestial Mechanics.

FIELD 4. ATMOSPHERIC SCIENCES. Includes the following Groups: Atmospheric Physics; Meteorology.

FIELD 5. BEHAVIORAL AND SOCIAL SCIENCES. Includes the following Groups: Administration and Management; Documentation and Information Technology; Economics; History, Law, and Political Science; Human Factors Engineering; Humanities; Linguistics; Man-machine Relations; Personnel Selection, Training, and Evaluation; Psychology (Individual and Group Behavior); Sociology.

FIELD 6. BIOLOGICAL AND MEDICAL SCIENCES. Includes the following Groups: Biochemistry; Bioengineering; Biology; Bionics; Clinical Medicine; Environmental Biology; Escape, Rescue, and Survival; Food, Hygiene and Sanitation; Industrial (Occupational) Medicine; Life Support; Medical and Hospital Equipment; Microbiology; Personnel Selection and Maintenance (Medical); Pharmacology; Physiology; Protective Equipment; Radiobiology; Stress Physiology; Toxicology; Weapon Effects.

FIELD 7. CHEMISTRY. Includes the following Groups: Chemical Engineering; Inorganic Chemistry; Organic Chemistry; Physical Chemistry, Radio and Radiation Chemistry.

FIELD 8. EARTH SCIENCES AND OCEANOGRAPHY. Includes the following Groups: Biological Oceanography; Cartography; Dynamic Oceanography; Geochemistry; Geodesy; Geography; Geology and Mineralogy; Hydrology and Limnology; Mining Engineering; Physical Oceanography; Seismology; Snow, Ice, and Permafrost; Soil Mechanics; Terrestrial Magnetism.

FIELD 9. ELECTRONICS AND ELECTRICAL ENGINEERING. Includes the following Groups: Components; Computers; Electronic and Electrical Engineering; Information Theory; Subsystems; and Telemetry.

FIELD 10. ENERGY CONVERSION (Non-propulsive). Includes the following Groups: Conversion Techniques; Power Sources; Energy Storage.

FIELD 11. MATERIALS. Includes the following Groups: Adhesives and Seals; Ceramics, Refractories, and Glasses; Coatings, Colorants, and Finishes; Composite Materials; Fibers and Textiles; Metallurgy and Metallography; Miscellaneous Materials; Oils, Lubricants, and Hydraulic Fluids; Plastics; Rubbers; Solvents, Cleaners, and Abrasives; Wood and Paper Products.

FIELD 12. MATHEMATICAL SCIENCES. Includes the following Groups: Mathematics and Statistics; Operations Research.

FIELD 13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING. Includes the following Groups: Air Conditioning, Heating, Lighting, and Ventilating; Civil Engineering; Construction Equipment, Materials, and Supplies; Containers and Packaging; Couplings, Fittings, Fasteners, and Joints; Ground Transportation Equipment; Hydraulic and Pneumatic Equipment; Industrial Processes; Machinery and Tools; Marine Engineering; Pumps, Filters, Pipes, Fittings, Tubing, and Valves; Safety Engineering; Structural Engineering.

FIELD 14. METHODS AND EQUIPMENT. Includes the following Groups: Cost Effectiveness; Laboratories, Test Facilities, and Test Equipment; Recording Devices; Reliability; Reprography.

FIELD 15. MILITARY SCIENCES. Includes the following Groups: Antisubmarine Warfare; Chemical, Biological, and Radiological Warfare; Defense; Intelligence; Logistics; Nuclear Warfare; Operations, Strategy, and Tactics.

FIELD 16. MISSILE TECHNOLOGY. Includes the following Groups: Missile Launching and Ground Support; Missile Trajectories; Missile Warheads and Fuses; Missiles.

FIELD 17. NAVIGATION, COMMUNICATIONS, DETECTION, AND COUNTERMEASURES. Includes the following Groups: Acoustic Detection; Communications; Direction Finding; Electromagnetic and Acoustic Countermeasures; Infrared and Ultraviolet Detection; Magnetic Detection; Navigation and Guidance; Optical Detection; Radar Detection; Seismic Detection.

FIELD 18. NUCLEAR SCIENCE AND TECHNOLOGY. Includes the following Groups: Fusion Devices (Thermonuclear); Isotopes; Nuclear Explosions; Nuclear Instrumentation; Nuclear Power Plants; Radiation Shielding and Protection; Radioactive Wastes and Fission Products; Radioactivity; Reactor Engineering and Operation; Reactor Materials; Reactor Physics; Reactors (Power); Reactors (Non-power); SNAP Technology.

FIELD 19. ORDNANCE. Includes the following Groups: Ammunition, Explosives, and Pyrotechnics; Bombs; Combat Vehicles; Explosions, Ballistics, and Armor; Fire Control and Bombing Systems; Guns; Rockets; Underwater Ordnance.

FIELD 20. PHYSICS. Includes the following Groups: Acoustics; Crystallography; Electricity and Magnetism; Fluid Mechanics; Masers and Lasers; Optics; Particle Accelerators; Particle Physics; Plasma Physics; Quantum Theory, Solid Mechanics; Solid-state Physics; Thermodynamics; Wave Propagation.

FIELD 21. PROPULSION AND FUELS. Includes the following Groups: Air-breathing Engines; Combustion and Ignition; Electric Propulsion; Fuels; Jet and Gas Turbine Engines; Nuclear Propulsion; Reciprocating Engines; Rocket Motors and Engines; Rocket Propellants.

FIELD 22. SPACE TECHNOLOGY. Includes the following Groups: Astronautics; Spacecraft; Spacecraft Trajectories and Reentry; Spacecraft Launch Vehicles and Ground Support.

REPORTS & TRANSLATIONS

1. AERONAUTICS

1A. Aerodynamics

AD-780 477/6GA PC$3.25/MF$1.45
Dayton Univ Ohio Research Inst
THE EFFECT OF BOUNDARY LAYER GROWTH ON THE STABILITY OF SUPERSONIC BOUNDARY LAYERS.
Final rept. Aug 71-Dec 72,
Louis I. Boehman. Sep 73, 26p AFFDL-TR-73-96
Contract F33615-70-C-1019

Descriptors: *Supersonic flight, *Boundary layer transition, Boundary layer, Stability, Supersonic flow, Laminar flow.
Identifiers: *Boundary layer growth.

The results of an investigation to determine the effects of boundary layer growth on the stability of supersonic laminar boundary layers are reported. Mean flow terms which arise because of boundary layer growth were added to the parallel flow, linearized small disturbance equations applicable to supersonic laminar boundary layer flows. Traveling wave solutions for the small disturbance quantities were assumed and the resulting stability equations were numerically integrated using Gram-Schmidt orthonomalization to control parasitic error growth. Various cases of augmented stability equations were considered ranging from the inclusion in all equations of all terms which arise because of boundary layer growth to the inclusion of only the streamtube stretching term to the streamwise momentum equation. (Modified author abstract)

AD-780 482/6GA Reprint
Cincinnati Univ Ohio Dept of Aerospace Engineering
SWEEP EFFECTS ON SUPERSONIC SEPARATED FLOWS - A NUMERICAL STUDY,
M. J. Werle, V. N. Vatsa, and S. D. Bertke. 9 Jul 73, 5p ARL-74-0087
Contracts F33615-73-C-4014, N00019-72-C-0136
Revision of report dated 12 Apr 73.
Availability: Pub. in AIAA Jnl., v11 n12 p1763-1765 Dec 73.

Descriptors: *Sweep wings, *Supersonic flow, Skin friction, Flow separation, Flow fields, Boundary layer, Heat transfer, Iterations.

The purposes of this study were to assess the influence of boundary-layer cross flow on the numerical algorithm used for two-dimensional separated flows, to take a first step at extending the two-dimensional separated boundary-layer/inviscid flow interaction model to three dimensions, and to inspect the influence of cross flow on heat-transfer levels in the separation and reattachment regions. The approach taken is wholly numerical, with finite-difference solutions to the boundary layer equations (modified to account for interaction with inviscid stream) presented for angles of sweep of o degrees, 20 degrees and 45 degrees. (Author)

PATENT-3 770 227 Not available NTIS
Department of the Air Force Washington D C
JET WING WITH MULTIPLE THRUST AUGMENTORS.
Patent,
Hans J. P. Von Ohain, and Charles A. Scolatti.
Filed 10 Sep 71, patented 6 Nov 73, 15p Rept nos. PAT-APPL-179 532,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Short takeoff aircraft, *Thrust augmentor nozzles, *Patents, Airfoils, Wing slots, Jet engines, Jet flow.
Identifiers: *PAT-CL-244-42-C-C.

The invention relates to an aircraft with VTOL or STOL operational capability. In accordance with the invention, the wing, or airfoil contour, is provided with a plurality of spanwise extending slots or ducts having inlet and outlet openings in the suction and pressure surfaces respectively of the wing. The slot openings are normally closed by spanwise extending flaps which fair into the airfoil contour and when the slots are open cooperate therewith to form individual thrust augmenting ducts. A large number of primary nozzles are provided for injecting high pressure air, derived for example from the bypass air of a conventional turbofan engine, into the ducts.

PATENT-3 774 867 Not available NTIS
Department of the Air Force Washington D C
ACOUSTIC WING STALL DELAYING DEVICE.
Patent,
Brian P. Quinn. Filed 27 Jun 72, patented 27 Nov 73, 5p Rept nos. PAT-APPL-266 787,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Boundary layer control, *Patents, Stalling, Orifices, Airfoils, Flow fields.
Identifiers: *Pat-CL-244-40-R.

The patent relates to an apparatus for delaying the onset of wing stall in an aircraft. Acoustic resonators are positioned in the forward portion of the upper surface of the wing with a movable panel to close the resonator cavities during normal flight. The movable panels partially expose the resonator cavities to provide orifices which generate the desired acoustic signal of approximately the same frequency as in the flow field.

PATENT-3 785 405 Not available NTIS
Department of the Air Force Washington D C
AERODYNAMIC NOZZLES IN RECTANGULAR DUCT.
Patent,
Brian P. Quinn. Filed 23 Feb 72, patented 15 Jan 74, 4p Rept nos. PAT-APPL-228 682,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Thrust augmentor nozzles, *Patents, Short takeoff aircraft, Thrust augmentation, Ducts, Aerodynamics, Airfoils.
Identifiers: PAT-CL-138-39.

The patent relates to a rectangular duct having a gas flow therethrough wherein there is a tendency for the gas flow to separate from a wall of the duct. An aerodynamic nozzle is positioned adjacent the wall that results in a downwash of gas which deters separation.

1B. Aeronautics

AD-779 820/0GA PC$3.25/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
SIMULATED IN-FLIGHT FIRE TEST ON A SELF-GENERATING OVERHEAT DETECTION SYSTEM.
Summary rept. Sep 72-Oct 72,
Richard G. Hill. Mar 74, 26p AFAPL-TR-73-70
Contract F33615-73-M-2009

Descriptors: *Cargo aircraft, *Jet engine nacelles, *Fire detectors, Heat, Aircraft fires, Simulators, Inflight, Response, Warning systems.
Identifiers: C-140 aircraft, T-12 engines, JT-12A6 engines.

Tests under simulated flight conditions were conducted on a self-generating overheat detection system installed in a C-140 airplane engines nacelle. They were run with the system in its normal configuration and also with a section of the detection cable pinched, opened, and shorted. The system was monitored for fire response time as well as for false alarms. The system performed well in its normal, pinched and opened, configurations, but the alarm time was increased by over 100% when the cable was shorted. No false alarms were noted during testing. (Author)

AD-780 585/4GA PC$9.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
EXPERIMENTAL INVESTIGATION OF BRAKE CHARACTERISTICS CONDUCTIVE TO STRUT CHATTER.
Master's thesis,
Jerry D. Brewer. Mar 74, 121p Rept no. GAW/MC/74-2

Descriptors: *Jet aircraft, *Landing gear, *Struts, Braking, Vibration, Dynamic response, Friction, Mathematical models, Theses.
Identifiers: *Chatter, T-38 aircraft, T-38A aircraft.

Fourteen dynamometer tests were performed on a B.F. Goodrich 2-727 brake assembly to investigate the characteristics inherent in modern brake design which are considered as indicators for brake induced landing gear strut chatter. The tests were designed to simulate normal service conditions experienced by the brake as part of the USAF T-38A aircraft system. Data from nine simulated landing roll tests and five simulated taxi tests were used to determine the slopes of the instantaneous coefficient of kinetic friction versus relative rubbing velocity curves for 10 ft/sec squared, 8 ft/sec squared, and 6 ft/sec squared deceleration conditions. (Modified author abstract)

PB-232 634/6GA PC$5.50/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
ANNUAL REVIEWS OF AIRCRAFT ACCIDENT DATA, U.S. AIR CARRIER OPERATIONS, 1970-1972.
Special study rept.
11 Apr 74, 180p* NTSB-ARC-74-1

Descriptors: *Aviation accidents, *Accident investigations, Collision research, Civil aviation, Statistical data, Aviation safety, General aviation aircraft, Commercial aircraft, Passenger aircraft, Injuries, Death.

The publication presents the record of aviation accidents which occurred in all operation of the U.S. Air Carriers for the period 1970-1972. It includes an analysis by classes of carriers, types of accidents, causes and related factors, and accident rates by aircraft make and model. Statistical tables which summarize the accidents, fatalities, and accident rates along with causal tables and the briefs of accidents are presented in the appendices.

PB-232 635/3GA PC$3.75/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.
A PRELIMINARY STATISTICAL ANALYSIS OF AIRCRAFT ACCIDENT DATA, U.S. CIVIL AVIATION, 1973.
Special study rept.
1 May 74, 55p* NTSB-APA-74-1

Descriptors: *Aviation accidents, *Accident investigations, Collision research, Civil aviation, Statistical data, Aviation safey, General aviation aircraft, Commercial aircraft, Passenger aircraft, Injuries.

The report presents the record of aircraft accidents which occurred in U.S. Civil Aviation Operations during calendar year 1973. It includes a statistical recapitulation of all accidents and a brief of each air carrier accident, containing the essential items of information.

PB-232 636/1GA PC$5.50/MF$1.45
National Transportation Safety Board, Washington, D.C. Bureau of Aviation Safety.

ANNUAL REVIEW OF AIRCRAFT ACCIDENT DATA. U.S. GENERAL AVIATION CALENDAR YEAR 1970.
Analysis and Summary data Aircraft accident rept.
18 Apr 74, 178p NTSB-ARG-74-1

Descriptors: *Aviation accidents, *Accident investigations, Collision research, Civil aviation, Statistical data, Aviation safety, General aviation aircraft, Commercial aircraft, Passenger aircraft, Helicopters, Injuries.

The report is a statistical compilation published by the National Transportation Safety Board and contains statistical information compiled from reports of 4,712 general aviation accidents that occurred during the calendar year 1970. Included in the total number of accidents are 63 collisions between aircraft. By coding each aircraft involved in the collisions, an additional 63 records are produced, bringing the total accidents records to 4,75. This figure reflects the actual number of pilots and aircraft involved in the accidents.

1C. Aircraft

AD-779 835/8GA PC$5.00/MF$1.45
Westinghouse Electric Corp Baltimore Md Systems Development Div
COBRA GLINT MODEL AH-1G.
Final rept.,
Richard H. Daumit, John B. Goodell, and Richard F. Higby. Mar 74, 156p LWL-CR-06P72B
Contract DAAD05-72-C-0284

Descriptors: *Helicopters, *Aircraft canopies, *Glint, Windows, Sunlight, Reflectivity, Computerized simulation, Computer programs, FORTRAN.
Identifiers: Huey Cobra, H-1 aircraft, AH-1G aircraft, Sunshades, FORTRAN 4 programming language.

The report details the development of a computer simulation model of the attack helicopter to predict the visual detectivity of the aircraft by a ground observer due to sun reflections from its windows. In addition, the model was exercised to determine probabilities of detection versus angles of incident sunlight and also used to determine sunshade configuration for reducing reflections. (Modified author abstract)

AD-779 926/5GA PC$3.75/MF$1.45
Notre Dame Univ Ind
PERFORMANCE ESTIMATES FOR POWERED PARAFOIL SYSTEMS.
Final rept.,
John D. Nicolaides. Feb 74, 67p AFFDL-TR-74-12
Contract F33615-71-C-1093

Descriptors: *Parawings, Parachutes, Steering, Gliders, Aerodynamic characteristics, Flight maneuvers, Numerical analysis.
Identifiers: Irish Flyer aircraft, *Parafoils.

The estimated flight performance of powered parafoil systems are presented for various system weights ranging from 10 pounds to 10,000 pounds. Special attention is given to level flight, climbing and descending flight, and take-off distance. The equations of motion are summarized and the effect of the thrust pitch angle is evaluated. Various system designs such as manned flight, cargo and weapon delivery, and decoy and jammer vehicles are considered as examples for using the performance curves and equations. (Author)

AD-779 928/1GA PC$7.50/MF$1.45
Calspan Corp Buffalo N Y
IDENTIFICATION AND CORRELATION OF THE F-4E STALL/POST-STALL AERODYNAMIC STABILITY AND CONTROL CHARACTERISTICS FROM EXISTING TEST DATA.
Final rept. Mar 72-Jun 73,
Bernard J. Eulrich, and Norman C. Weingarten. Aug 73, 345p Rept no. CALSPAN-AK-5126-F-1
AFFDL-TR-73-125
Contract F33615-72-C-1248

Descriptors: *Jet fighters, *Aerodynamic stability, Stalling, Angle of attack, Aerodynamic characteristics, Kalman filtering, Wind tunnel models.
Identifiers: F-4 aircraft, F-4E aircraft.

The report documents the results of a study performed for the United States Air Force Flight Dynamics Laboratory to identify the high angle of attack post stall aerodynamic stability and control characteristics of the F-4 aircraft from existing full scale and radio-controlled drop model test data and to correlate these results with similar characteristics obtained from wind tunnel tests. A parameter identification procedure was set up to extract these nonlinear characteristics from flight test records using a nonlinear iterated Kalman filter/fixed-point smoother algorithm and a least square equation error method. Model form is established from wind tunnel data by representing the aerodynamic coefficients by Taylor's series expansions for selected ranges of angle of attack. (Modified author abstract)

AD-779 956/2GA PC$5.00/MF$1.45
Army Natick Labs Mass Clothing and Personal Life Support Equipment Lab
ENGINEERING EVALUATION OF AGE LIFE EXTENSION, T-10 TROOP MAIN PARACHUTE.
Technical rept.,
Richard D. Wells, Vasant K. Devarakonda, and Michael E. Mahar. Mar 74, 39p Rept nos.
C/PLSEL-123, USA-NLABS-TR-74-46-CE

Descriptors: *Parachutes, Life expectancy, Parachute canopies, Parachute fabrics, Maintenance, Storage.
Identifiers: T-10 parachutes, Service life.

An engineering evaluation of T-10 Troop Main Parachute Equipment sampled from the six to twelve year total-age classes in service at Fort Bragg, NC was conducted by the US Army Natick Laboratories. Dynamic drop tests were made on harnesses, and laboratory strength and elongation tests were made on nylon material components. The findings support the present 13 year total age limit for harnesses and risers, and lead to the conclusion that the 12 year limit recently established for T-10 Chest Reserve Parachute Assemblies applies equally to the Main Parachutes. Log book data were insufficient to provide a basis for establishing limits for initial storage life and service life, as distinguished from total life. (Author)

AD-779 957/0GA PC$3.00/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS), CH-47A ELECTRO-MECHANICAL CYCLIC TRIM ACTUATOR.
Interim rept. Jan 64-Jul 73.
May 74, 22p Rept no. USAAVSCOM-TR-74-27

Descriptors: *Helicopters, *Attitude control systems, Logistics support, Quality control, Spare parts, Maintainability, Cost analysis, Failure.
Identifiers: MISS(Major Item Special Studies), Major item special studies, H-47 aircraft, CH-47A aircraft, *Logistics management.

Major Item Special Study (MISS) reports are performed on DA Form 2410 reportable components. These are time change items and certain condition change items selected because of high cost or need for intensive management. Basically, the MISS reports are concerned with analyzing reported removal data presented in the Major Item Removal Frequency (MIRF) report. The failure modes reported for each removal are examined and grouped into categories which are intended to clarify the intent of the data reporting. From this data, removal distribution can be plotted and an MTR (mean time to removal) can be calculated. The MISS reports then investigate possible cost savings based on total elimination of selected failure modes. These modes are chosen because of the percentage of failures they represent and/or because they appear to be feasible Product Improvement Program (PIP) areas. (Author)

AD-780 016/2GA PC$4.00/MF$1.45
Army Aviation Systems Test Activity Edwards AFB Calif
INSTRUMENT FLIGHT-EVALUATION OH-6A HELICOPTER. PART I.
Final rept. Feb 72-Aug 73,
Albert L. Winn, Warren E. Griffith, II, and Carl F. Mittag. Nov 73, 81p Rept no. USAASTA-72-06

Descriptors: *Helicopters, *Instrument flight, Flight instruments, Flight control systems, Flight testing, Deficiencies.
Identifiers: H-6 aircraft, OH-6A aircraft.

A limited flying qualities and operational performance evaluation was conducted on the OH-6A helicopter to determine the suitability for operation under instrument flight conditions. The operational evaluation was performed with and without a Kaiser FP-50B flight director system installed. Tests were conducted at the United States Army Aviation Systems Test Activity, Edwards Air Force Base, California, during the period from February 1972 to August 1973. (Modified author abstract)

AD-780 029/5GA PC$3.75/MF$1.45
United Aircraft Corp Stratford Conn Sikorsky Aircraft Div
CONTINUOUS SEAM DIFFUSION BOND TITANIUM SPAR EVALUATION.
Final rept. 20 Jun 72-20 Jan 74,
Maron J. Bonassar, and John J. Lucas. Apr 74, 74p AMMRC-CTR-74-37
Contract DAAG46-72-C-0175

Descriptors: *Rotor blades(Rotary wings), *Titanium alloys, *Spars, *Diffusion bonding, Fatigue(Mechanics), Fabrication, Composite materials, Aluminum alloys, Vanadium alloys, Fiberglass, Panels, Honeycomb structures, Helicopters.
Identifiers: Titanium alloy 6Al 4V.

The objectives of this program were establishment of a technology to fabricate helicopter titanium main rotor blade spars cut from sheet material and joined by continuous seam diffusion bonding (CSDB) and the eventual application of this technology in the manufacturing of various components at reduced overall cost. The effects of different thermal treatments after bonding were determined by tensile and fatigue testing of small test specimens fabricated from titanium sheet flat panels joined by CSDB. Three 9-foot long spar sections were then fabricated, and two were tested in fatigue. The results indicate that continuous seam diffusion bonding has fatigue strength characteristics as good as, or better than, present fusion welded main rotor blade spar specimens and should be further evaluated for this application. (Modified author abstract)

AD-780 053/5GA PC$4.00/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
A SUMMARY OF HELICOPTER VORTICITY AND WAKE TURBULENCE PUBLICATIONS WITH AN ANNOTATED BIBLIOGRAPHY.
Final rept. Jan 65-Nov 73,
Jack J. Shrager. May 74, 174p Rept no. FAA-NA-73-68 FAA-RD-74-48

Descriptors: *Helicopters, *Bibliographies, Vortices, Wake, Airfoils, Helicopter rotors, Noise(Sound), Abstracts.

A review of all literature published since 1964 relating to helicopter vortex systems and wake turbulence was made. The results of the review are evaluated and summarized, and conclusions are drawn relative to that review. The documents are grouped in general categories, and this is further supplemented by an annotated bibliography and

authors index. Also incorporated in the review is a comparative analysis of rotary-wing versus fixed-wing circulation intensity time-history.

AD-780 062/6GA PC$5.00/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
AGARD FLIGHT TEST INSTRUMENTATION SERIES. VOLUME 1. BASIC PRINCIPLES OF FLIGHT TEST INSTRUMENTATION ENGINEERING.
AGARDograph rept.,
A. Pool, D. Bosman, and W. D. Mace. 1973, 165p
Rept no. AGARD-AG-160-Vol-1
See also Volume 2, AD-758 589. NATO furnished.

Descriptors: *Aircraft equipment, *Flight testing, *Instrumentation, Checkout equipment, Inflight, Telemeter systems, Recording systems, Multichannel communications, Onboard, Signal processing.
Identifiers: *Onboard checkout systems.

The main purpose of the AGARD Flight Test Instrumentation Series is to provide monographs on the more important aspects of flight test instrumentation as a reference for the flight test engineer. The first monographs in the series discuss in-flight temperature measurements, fuel flow and engine rotation speed measurements, open and closed-loop accelerometers and magnetic tape recording; they will be followed by others. In this introductory volume it has been tried to highlight the main lines along which a flight test instrumentation system is developed, to indicate the main steps which must be taken during the design and to define the basic concepts used by each specialist. A flight test system is considered to include both the data collection and the data processing systems.

AD-780 098/0GA PC$6.50/MF$1.45
Calspan Corp Buffalo N Y
IN-FLIGHT SIMULATION OF MINIMUM LONGITUDINAL STABILITY FOR LARGE DELTA-WING TRANSPORTS IN LANDING APPROACH AND TOUCHDOWN. VOLUME II. SUPPORTING TECHNICAL DATA AND ANALYSIS.
Final technical rept.,
Richard Wasserman, John F. Mitchell, William W. Rickard, Ronald W. Huber, and Arno E. Schelhorn. Feb 73, 257p Rept no. CALSPAN-AK-5084-F-1-Vol-2 AFFDL-TR-72-143-Vol-2
Contract F33615-72-C-1386
See also Volume 1, AD-761 120.

Descriptors: *Jet transport planes, *Aircraft landings, Delta wings, Supersonic aircraft, Flight simulators, Aerodynamic characteristics, Approach, Ground effect.
Identifiers: TIFS(Total In Flight Simulator), Total in flight simulator, *Longitudinal stability, Touchdown.

An in-flight simulation to investigate minimum longitudinal stability for large delta-wing transports in landing approach and touchdown (including ground effect) was conducted using the USAF/Calspan Total In-Flight Simulator (TIFS) airplane. The airplane nonlinear equations of motion, as well as the representation of the engine characteristics and the control system used in this in-flight investigation are presented. Details of the simulation or representative piloting tasks for the landing approach (e.g., artificial crosswind landing) are described. Detailed pilot comments, touchdown parameters, measures of turbulence and pilot workload obtained during the in-flight evaluation are included in this report. (Modified author abstract)

AD-780 099/8GA PC$4.75/MF$1.45
Mcdonnell Aircraft Co St Louis Mo
DESIGN METHODS FOR SPECIFYING HANDLING QUALITIES FOR CONTROL CONFIGURED VEHICLES. VOLUME I. TECHNICAL DISCUSSION.
Technical rept. 15 Jan 73-15 Nov 73,
Robert V. Brulle, and Daniel C. Anderson. 15 Nov 73, 146p AFFDL-RD-73-142-Vol-1
Contract F33615-73-C-3064
See also Volume 2, AD-779 731.

Descriptors: *Jet fighters, *Flight control systems, *Flight simulators, Pilots, Airframes, Flight paths, Augmentation, Mathematical models, Digital simulation.
Identifiers: CCV(Control Configured Vehicles), Control configured vehicles, Pilot ratings.

A method for predicting aircraft pilot ratings which is applicable to control configured vehicles (CCV's) is developed based on aircraft performance and pilot workload. A discussion of this method of handling quality analysis, and a description of four random tracking pilot rating correlations developed using the method are presented in Volume I of the report. A literature survey classifying the most recent reports applicable to flying qualities is tabulated. (Modified author abstract)

AD-780 100/4GA PC$5.75/MF$1.45
General Dynamics Fort Worth Tex Convair Aerospace Div
DEVELOPMENT OF AN EMPIRICALLY BASED COMPUTER PROGRAM TO PREDICT THE AERODYNAMIC CHARACTERISTICS OF AIRCRAFT. VOLUME I. EMPIRICAL METHODS.
Final rept. Dec 72-Oct 73,
Roy T. Schemensky. Nov 73, 219p AFFDL-TR-73-144-Vol-1
Contract F33615-73-C-3043
See also Volume 2, AD-779 737.

Descriptors: *Jet aircraft, *Aerodynamic characteristics, *Computer programming, Jet bombers, Jet transport planes, Tanker planes, FORTRAN, Ground effect, Manuals.

The report presents the methods, equations, and substantiating data for an empirically based computer program for the rapid and accurate evaluation of the aerodynamic characteristics of large aircraft (bombers, tankers, and transports) from takeoff through landing and through the subsonic, transonic, and supersonic speed regimes. The program calculates lift, moment, and drag characteristics at both low- and high-lift conditions, including the effects of ground proximity during landing and takeoff. The input requires the configuration geometry and the aerodynamic conditions for which solutions are desired. The program includes the capability of analyzing both fixed-wing and variable-sweep-wing configurations as well as the aerodynamic characteristics of the most recent supercritical wing designs. (Modified author abstract)

AD-780 214/3GA PC$3.75/MF$1.45
Naval Ordnance Lab White Oak Md
SELF-COMPENSATING STORE EJECTION.
Final rept. 1970-73,
Raymond R. Maestri, and Leon H. Schindel. 5 Feb 74, 63p Rept no. NOLTR-74-32

Descriptors: *Jet fighters, *External stores, *Bomb ejectors, Separation, Bombing, Bomb trajectories, Aerodynamic forces, Ballistics, Dispersions, Wind tunnel models.
Identifiers: F-14 aircraft, F-111 aircraft.

The report concerns the concept of a continuously adjustable ejector system which accounts for the aircraft flight condition and ejects a store with an initial angular rate and linear velocity that results in a safe, repeatable, predictable nearly ballistic trajectory throughout the aircraft/store carriage envelope. The concept is especially important in the supersonic regime where the aerodynamic forces in the disturbed flow field control the initial trajectory. (Modified author abstract)

PATENT-3 785 593 Not available NTIS
Department of the Air Force Washington D C
AIRCRAFT PROPULSION SYSTEM.
Patent,
Hans J. P. Von Ohain, Roscoe H. Mills, and Charles A. Scolatti. Filed 10 Sep 71, patented 15 Jan 74, 8p Rept nos. PAT-APPL-179 521,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Short takeoff aircraft, *Propulsion system components, *Patents, Thrust augmentation, Ducts, Nozzles, Coanda effect.
Identifiers: PAT-CL-244-12-R.

The invention relates to a propulsion system particularly adapted to VTOL and STOL type of aircraft. A main wing has an auxiliary wing arranged either above or below in spaced biplane relation with the space between the wings, in combination with suitable end plates, forming a rectangular propulsion duct extending spanwise on each side of a central fuselage. A gas turbine driving an air compressor has the compressed air therefrom delivered through a conduit formed in one of the wings from whence it passes to a series of injection nozzles which inject air into the duct inlet. The nozzles are housed in streamlined struts or housings extending vertically between the wings and transverse to the duct. One of the wings is provided with an adjustable trailing edge flap for varying the discharge area of the propulsive duct diffuser and the other wing is provided with a flap provided with nozzles at its leading edge and adapted to discharge over the suction surface of the flap.

1D. Aircraft Flight Control and Instrumentation

AD-780 018/8GA PC$3.75/MF$1.45
Army Aviation Systems Test Activity Edwards AFB Calif
FLIGHT EVALUATION - PACER SYSTEMS, INC. LORAS II AIRSPEED SYSTEM.
Rept. no. 3 (Final), 29 Jan-5 Jul 73,
Barclay H. Boirun, Floyd Dominick, James S. Kishi, Robert K. Merrill, and John R. Smith. Mar 74, 65p Rept no. USAASTA-71-30-3
Report on Low-Airspeed Sensor. See also report dated Mar 73, AD-764 240.

Descriptors: *Short takeoff aircraft, *Helicopters, *Airspeed indicators, Flight testing, Calibration, Detectors, Omnidirectional, Flight instruments, Wind tunnel tests.
Identifiers: H-1 aircraft, UH-1C aircraft, Loras-2 airspeed indicators.

Airspeed calibration tests were conducted on the Pacer Systems, Inc. LORAS II low-range airspeed system to determine its suitability for use as a helicopter airspeed instrument. Testing was conducted by the United States Army Aviation Systems Test Activity at Edwards Air Force Base, California between 29 January and 5 July 1973. The evaluation required 17.2 productive flight test hours. (Modified author abstract)

AD-780 019/6GA PC$3.75/MF$1.45
Army Aviation Systems Test Activity Edwards AFB Calif
FLIGHT EVALUATION - J-TEC AIRSPEED SYSTEM.
Rept. no. 4 (Final), 17 Nov-19 Mar 73,
Floyd Dominick, Barclay H. Boirun, James S. Kishi, and Robert P. Jefferis. Apr 74, 56p Rept no. USAASTA-71-30-4
Report on Low Airspeed Sensor. See also report dated Mar 74, AD-780 018.

Descriptors: *Short takeoff aircraft, *Helicopters, *Airspeed indicators, Flight testing, Installation, Maintainability, Flight instruments, Wind tunnel tests.
Identifiers: VA-210 airspeed indicators, H-1 aircraft, NUH-1C aircraft.

Airspeed calibration tests were conducted on the J-TEC Associates, Inc. Model VA-210 true airspeed sensor to determine its suitability for operational and flight test use as a helicopter and V/STOL aircraft airspeed instrument. The J-TEC system operates on the principle of counting vortices shed by a flubb body (cylindrical post) in the airstream. (Modified author abstract)

AD-780 379/4GA PC$3.75/MF$1.45
Federal Aviation Administration Washington D C Systems Research and Development Service
EXPERIMENTATION AND EVALUATION OF IMPROVED STALL WARNING EQUIPMENT, PHASE II.
Final rept.,
Barry C. Scott. May 74, 65p Rept no. FAA-RD-73-179
Supersedes report AD-773 384.

Descriptors: *Flight instruments, *Stall warning indicators, Airspeed indicators, Flight maneuvers, Stalling, Approach, Flight testing, Aviation safety.
Identifiers: *Aircraft onboard checkout systems, *General aviation aircraft.

The report describes the experimentation conducted to develop a more comprehensive flight test program for evaluation of stall warning systems and then uses this program to evaluate five typical and improved stall warning systems. Based on results of these tests suggested revisions and additions to Federal Aviation Regulations Part 23, Stall Warning Requirements are discussed. The report supersedes report of identical title dated November 1973. (Modified author abstract)

1E. Air Facilities

AD-779 953/9GA PC$4.00/MF$1.45
Austin Research Engineers Inc Tex
CONTINUOUSLY REINFORCED CONCRETE AIRFIELD PAVEMENT. VOLUME II. DESIGN MANUAL FOR CONTINUOUSLY REINFORCED CONCRETE OVERLAY PAVEMENTS.
Final rept. Feb 72-Dec 73,
Harvey J. Treybig, B. Frank McCullough, and W. Ronald Hudson. May 74, 87p AFWL-TR-73-229-Vol-2, FAA-RD-74-33-2
Contracts F29601-72-C-0057, DOT-FA71WAI-218
Sponsored in part by Army Engineer Waterways Experiment Station, Vicksburg, Miss. See also Volume 1, AD-780 511 and Volume 3, AD-780 512.

Descriptors: *Pavements, *Runways, *Construction, Reinforced concrete, Coverings, Reinforcing materials, Steel, Performance(Engineering), Nondestructive testing, Stresses, Deflection, Fatigue(Mechanics), Modulus of elasticity, Deformation, Loads(Forces), Manuals.
Identifiers: Design.

The report constitutes Volume II of a four-volume series on design and construction of new and overlay continuously reinforced concrete airfield pavement, and contains a detailed procedure for designing overlay pavements. It contains procedures for evaluating the existing pavement and the materials composing the pavement, selecting the required overlay thickness, designing the transverse and longitudinal reinforcing steel and designing the joints. The design procedures are presented in the form of a series of charts and nomographs from which design parameters may be obtained by entering with appropriate input parameters. A detailed procedure for resilient modulus testing is also provided. (Author)

AD-780 184/6GA PC$7.75/MF$1.45
Naval Civil Engineering Lab Port Hueneme Calif
A STRUCTURAL EVALUATION OF RAPID METHODS OF BACKFILLING FOR BOMB DAMAGE REPAIR.
Final rept. Jul 71-Apr 73,
James B. Forrest, and T. A. Shugar. Mar 74, 94p AFWL-TR-73-29

Descriptors: *Bombs, *Craters, *Backfills, *Landing fields, Bomb damage, Materials, Field tests, Computerized simulation.
Identifiers: Finite element analysis.

The effectiveness of using conventional materials and procedures for backfilling and repairing bomb craters in airfield pavements is evaluated. Candidate backfill systems were analyzed by a finite element computer program with an automatic mesh generation capability. A nonlinear axisymmetric analysis predicts the stresses, strains, and deformations in the repaired crater, which are induced by simulated static aircraft wheel forces. Field tests were also conducted in which scaled models of craters were excavated and backfilled with well-graded and uniformly graded aggregates, densely and loosely placed. Each repaired crater was tested without a capping and with a 6-inch-thick concrete capping under a simulated F-4 wheel load. It was found that coarse, uniformly graded backfill with a capping equivalent in stiffness to 6 inches of portland cement concrete meets the requirements for rapidly repairing bomb craters. If possible, the aggregate should be discharged into the crater from a height of about 5 feet. (Author)

AD-780 299/4GA PC$9.25/MF$1.45
Army Engineer Waterways Experiment Station Vicksburg Miss
AIRPLANE LANDING MAT INVESTIGATION: ENGINEERING TESTS ON STEEL, PIERCED TYPE, M8 AND ALUMINUM, PIERCED TYPE, M9.
Technical memo.
May 51, 123p Rept no. AEWES-TM-3-324

Descriptors: *Landing mats, Test methods, Performance(Engineering), Loads(Forces), Steel, Aluminum alloys, Trafficability, Waterproofing, Resistance, Fuels.
Identifiers: M-8 mats, M-9 mats.

The objectives of the tests are: To determine if single layers of airplane landing mat, could withstand normal loading by military aircraft for one year; To determine the effects of single wheel loading; and, to determine suitability for waterproofing soil bases on which the landing mats are placed.

AD-780 511/2GA PC$5.75/MF$1.45
Austin Research Engineers Inc Tex
CONTINUOUSLY REINFORCED CONCRETE AIRFIELD PAVEMENT. VOLUME I. TESTS ON EXISTING PAVEMENTS AND SYNTHESIS OF DESIGN METHODS.
Final rept. Feb 72-Dec 73,
Harvey J. Treybig, B. Frank McCullough, and W. Ronald Hudson. May 74, 212p AFWL-TR-73-229-Vol-1, FAA-RD-74-33-1
Contracts F29601-72-C-0057, DOT-FA71WAI-218
Sponsored in part by Army Engineer Waterways Experiment Station, Vicksburg, Miss. See also Volume 2, AD-779 953.

Descriptors: *Pavements, *Runways, *Test methods, Reinforced concrete, Performance(Engineering), Bituminous coatings, Landing fields, Failure(Mechanics), Nondestructive testing, Coverings, Construction materials, Soil mechanics, Loads(Forces), Deformation, Fracture(Mechanics), Stresses, Deflection, Statistical analysis.
Identifiers: Design, Portland cements, Pavement distress.

The report contains support documentation of design methods for continuously reinforced concrete pavements, both overlays and new construction. The experimental investigations of continuously reinforced concrete airfield pavements conducted as part of this research are described and analyzed. The field studies provide experimental validation of the design procedure. The report includes the general outline and analysis for design procedure for both overlay and new pavement. It includes a discussion of material evaluation requirements, handling of aircraft traffic projections for use in fatigue design, and the development of a fatigue curve. The report includes construction recommendations and suggestions based on the current state of knowledge and experience. A comparison is presented of the analyses and observations made on the pavements investigated in the field study. (Modified author abstract)

AD-780 512/0GA PC$4.00/MF$1.45
Austin Research Engineers Inc Tex
CONTINUOUSLY REINFORCED CONCRETE AIRFIELD PAVEMENT. VOLUME III. DESIGN MANUAL FOR CONTINUOUSLY REINFORCED CONCRETE PAVEMENT.
Final rept. Feb 72-Dec 73,
Harvey J. Treybig, B. Frank McCullough, and W. Ronald Hudson. May 74, 96p AFWL-TR-73-229-Vol-3, FAA-RD-74-33-3
Contracts F29601-72-C-0057, DOT-FA71-WAI-218
Sponsored in part by Army Engineer Waterways Experiment Station Vicksburg, Miss. See also Volume 2, AD-779 953 and Volume 4, AD-780 513.

Descriptors: *Pavements, *Runways, *Construction, Reinforced concrete, Performance(Engineering), Construction materials, Reliability, Steel, Thickness, Joints, Fatigue(Mechanics), Soil tests, Anchors(Structural), Landing fields, Stresses, Manuals.
Identifiers: Design, Pavement bases.

The report constitutes Volume III of a four-volume series on design and construction of new and overlay continuously reinforced concrete airfield pavement and contains a detailed procedure for designing new pavements. It contains procedures for evaluating values, selecting the required slab thickness, designing transverse and longitudinal reinforcing steel, joint design and designing anchorage systems. The design procedures are presented in the form of a series of charts and nomographs from which design parameters may be obtained by entering with appropriate input parameters. A detailed procedure for resilient modulus testing is also provided. (Author)

AD-780 513/8GA PC$3.25/MF$1.45
Austin Research Engineers Inc Tex
CONTINUOUSLY REINFORCED CONCRETE AIRFIELD PAVEMENT, VOLUME IV. GUIDE SPECIFICATION.
Final rept. Feb 72-Dec 73,
Harvey J. Treybig, B. Frank McCullough, and W. Ronald Hudson. May 74, 40p AFWL-TR-73-229-Vol-4, FAA-RD-74-33-4
Contracts F29601-72-C-0057, DOT-FA71WAI-218
Sponsored in part by Army Engineer Waterways Experiment Station, Vicksburg, Miss. See also Volume 3, AD-780 512.

Descriptors: *Pavements, *Runways, *Construction, Specifications, Reinforced concrete, Coverings, Cements, Reinforcing materials, Steel, Road building equipment, Acceptability, Test methods, Aging(Materials), Production, Mixing, Protection.
Identifiers: Design, Portland cements.

The report constitutes Volume IV of a four-volume series on design and construction of new and overlay continuously reinforced concrete airfield pavement and contains guidance for construction fo these pavements. It contains recommendations for material requirements, construction requirements, equipment, concrete production and placement, steel placement, protection and curing, and field acceptance testing procedures and requirements. The general principles set forth are common to all types of concrete pavement construction but specific procedures and requirement are directed toward construction of pavements with continuous reinforcing steel. (Author)

2. AGRICULTURE

2A. Agricultural Chemistry

PATENT-3 306 772 Not available NTIS
Department of Agriculture, Washington, D.C.
SOLVENT AND PROCESS FOR OBTAINING UNDEPOLYMERIZED AMYLOSES.
Patent, *Filed 3 Apr 64, patented 28 Feb 67, Stig R. Erlander, and Robert Tobin. 28 Feb 67, 2p PAT-APPL-357 329,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Amyloses, *Starches, *Dissolving, Thiocyanates, Organic solvents, Molecular weight, Solvent extraction, Precipitation(Chemistry).
Identifiers: PAT-CL-127-70.

The invention relates to a process for obtaining amyloses that apparently have suffered no depolymerization. Aqueous solutions containing per liter thereof about 5 moles of lithium thiocyanate and at least 1 mole but preferably 2.5 moles of guanidinium thiocyanate dissolve all varieties of starches at ambient temperature without causing depolymerization of the amylose which then can be fairly selectively and almost quantitatively precipitated from solution by critical concentrations of ethanol or acetone. The amylose of residual amylopectin is freed by selectively complexing the former with amyl or butyl alcohols at a non-depolymerizing temperature of about 45C.

TT-73-54052 PC$3.00
Department of Agriculture, Washington, D.C.
DETERMINATION OF THE MERCURY CONTENT IN THE GRAIN TREATED AND UNTREATED WITH FUNGICIDAL MERCURY PREPARATIONS (OZNACZANIE ZAWARTOSCI RTECI W ZIARNIE ZBOZ NIEZAPRAWIANYM I ZAPRAWIANYM PREPARATAMI RTECIOWYMD),
B. Legatowa, S. Hordynska, and I. Bernstein. 1974, 6p
Trans. of Roczniki Panstwowego Zakladu Higieny (Poland) v14 n3 p221-224 1963, by A. Skup. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Grains(Food), *Mercury organic compounds, *Fungicides, Poland, Translations.

The mercury content of grain samples are reported. Values for untreated grain and grain treated previously with phenylmercuric acetate fungicide are compared.

TT-74-50016 PC$8.00/MF$1.45
National Science Foundation, Washington, D.C.
AGROCHEMISTRY OF THE SOILS OF THE USSR: FAR EAST,
A. V. Sokolov. 1974, 360p
Trans. of mono. Agrokhimicheskaya Kharakteristika Pochv USSR, Dalnii Vostok, Moscow, 1971, by N. Kaner. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Soils, *USSR, *Soil chemistry, Soil classification, Trace elements, Cultivation, Soil profiles, Soil fertility, Investigations, Soil properties, Translations.

Contents:
Soils of the Maritime and Amur Territories;
Agrochemical description of soils of the Maritime Territory;
Agrochemical description of soils in the Khabarovsk Territory and efficacy of fertilizers;
Agrochemical description of soils in the Amur Region;
Content of trace elements in the soils of the Far East and the effect of trace fertilizers;
Agrochemical characteristic of soils in the Kamchatka Region;
Soils of the Magadan Region and their agrochemical description;
Agrochemical description of so
ils in the Sakhalin Region.

2B. Agricultural Economics

PB-232 929/0GA PC$6.00/MF$1.45
Earth Satellite Corp., Washington, D.C.
RANGELAND CASE STUDY.
Interim rept.
Apr 74, 242p USGS-DO-74-008
Contract DI-14-08-001-13519
Prepared in cooperation with Booz, Allen Applied Research, Bethesda, Md.

Descriptors: *Rangeland management, *Benefit cost analysis, Range resources, Environmental surveys, Range grasses, Scientific satellites, Remote sensing.
Identifiers: ERTS-1 satellite, Rangelands.

Rangeland management was selected as a case study because of the magnitude of potential benefits. The case study reflects the multipurpose goals of rangeland management and identifies ERS-derived information including inventories for long term range reallocation, monitoring decisions to improve range productivity, and range feed condition. A prospective ERS system could improve rangeland inventories, could make a coordinated system of rangeland monitoring possible and improve range feed condition reports. The gross annualized discounted benefits of ERS rangeland applications are estimated to be between $8.8 and $30.4 million during the period 1977-86.

2C. Agricultural Engineering

CONF-740317-1 PC$4.00/MF$1.45
Tennessee Valley Authority, Muscle Shoals, Ala. (Usa); Oak Ridge National Lab., Tenn. (Usa).
USES OF POWER PLANT DISCHARGE WATER IN GREENHOUSE PRODUCTION.
B. J. Bond, W. K. Furlong, L. D. King, C. E. Madewell, and J. B. Martin. 1974, 20p

Descriptors: (*Power plants, *Thermal effluents), (*Greenhouses, *Environmental engineering), (*Cucumbers, *Production), (*Buildings, Environmental engineering), Air conditioning, Heating, Humidity control, Plant growth, Temperature control, Waste heat.

For abstract, see NSA 29 12, number 29410.

PATENT-3 312 341 Not available NTIS
Department of Agriculture, Washington, D.C.
FLOTATION SEPARATION OF DRY MILLED CEREAL GRAIN COMPONENTS.
Patent, *Filed 2 Aug 65, patented 4 Apr 67, Laurence A. Weinecke, and Ronald R. Montgomery. 4 Apr 67, 3p PAT-APPL-476 760,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. $0.50.

Descriptors: *Grains(Food), *Flotation, *Patents.
Identifiers: PAT-CL-209-2.

This invention relates to a flotation process and centerfeed apparatus for the separation of the aspirated effluent from a corn or sorghum dry milling operation into separate streams of highest quality brewer's grits and of germ, whereby the prior art flaking roll operation that seriously lowers the yields of minimum oil content large grits (endosperm) is avoided. In addition, the breakfast cereal industry, which pays a premium for the large grits that are processed into flakes, demands very low oil contents to minimize the possibilities of storage rancidity.

2D. Agronomy and Horticulture

E74-10506 PC$6.00/MF$1.45
Lockheed Electronics Co., Inc., Houston, Tex. Houston Aerospace Systems Div.
SKYLAB S192 DATA EVALUATION: COMPARISONS WITH ERTS-1 RESULTS,
C. Y. Chang. Jan 74, 58p LEC-1711 NASA-CR-134246
Contract NAS9-12200
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S. D. 57198.

Descriptors: Nebraska, Multispectral band scanners, Agriculture, Crop identification, EREP, Skylab program, Earth resources program, Signal to noise ratios, Data correlation.

The author has identified the following significant results. The Skylab S192 data was evaluated by: (1) comparing the classification results using S192 and ERTS-1 data over the Holt County, Nebraska agricultural study area, and (2) investigating the impact of signal-to-noise ratio on classification accuracies using registered S192 and ERTS-1 data. Results indicate: (1) The classification accuracy obtained on S192 data using its best subset of four bands can be expected to be as high as that on ERTS-1 data. (2) When a subset of four S192 bands that are spectrally similar to the ERTS-1 bands was used for classification, an obvious deterioration in the classification accuracy was observed with respect to the ERTS-1 results. (3) The thermal bands 13 and 14 as well as the near IR bands were found to be relatively important in the classification of agricultural data. Although bands 11 and 12 were highly correlated, both were invariably included in the best subsets of the band sizes, four and beyond, according to the divergence criterion. (4) The differentiation of corn from popcorn was difficult on both S192 and ERTS-1 data acquired at an early summer date. (5) The results on both sets of data indicate that it was relatively easy to differentiate grass from any other class.

E74-10539 PC$4.00/MF$1.45
Agricultural Research Service, Weslaco, Tex.
REFLECTANCE OF VEGETATION, SOIL, AND WATER.
Progress rept. no. 7, 19 Feb-19 Apr 74,
Craig L. Wiegand. 5 May 74, 11p NASA-CR-138288
Contract NASA-Order-S-70251

Descriptors: Soil, Spectral signatures, Multispectral band scanners, Reflectance, Plants(Botany), Earth resources program, Spectrum analysis, Data acquisition, Crop growth.

The author has identified the following significant results. Reflectance of crop residues, that are important in reducing wind and water erosion, was more often different from bare soil in band 4 than in bands 5, 6, or 7. The plant parameters leaf area index, plant population, plant cover, and plant height explained 95.9 percent of the variation in band 7 (relective infrared) digital counts for cotton and 78.2 percent of the variation in digital counts for the combined crops sorghum and corn; hence, measurable plant parameters explain most of the signal variation recorded for cropland. Leaf area index and plant population are both highly correlated with crop yields; since plant population can be readily measured (or possibly inferred from seeding rates), it is a useful measurement for calibrating ERTS-type MSS digital data in terms of yield.

JPRS-62091 PC$3.75/MF$1.45
Joint Publications Research Service, Arlington, Va.

TRANSACTIONS ON WHEAT EXPERIMENTATION IN THE USSR.
24 May 74, 72p
Trans. of Selsktsiya i Semenovodstvo (USSR) n1 p44-57, n6 p69-75 1973; n1 p13-16, 21-23, 31-33, 58-66 1974.

Descriptors: *Wheat plants, *USSR, Plant growth, Rusts(Fungi), Plant genetics, Winter, Plant reproduction, Spring season, Irrigation, Translations.

The report contains selected articles on experimentation with both spring and winter wheat varieties grown in the USSR.

TT-73-58044 PC$4.00/MF$1.45
Agricultural Research Service, Washington, D.C.
ISOLATION OF MALE STERILE PLANTS AND THEIR USE IN THE PRODUCTION OF HETEROSIS HYBRIDS OF ALFALFA PLANTS (VYDELENIE MUZSKOSTERILNYH RASTENII I ISNOLZOVANIE IH V SOZDANII GETEROZISNYH GIBRIDOV LYUCERNY),
P. A. Lubenec, and A. V. Nagovicina. 1974, 6p
Trans. of Vestnik Selskokhozyaistvennoi Nauki (USSR) v2 p33-38 1968. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Plants(Botany), *Hybridization, Plant genetics, Sterility, Insects, Pollen, Seeds, Quality, Production, Selection, Translations, USSR.
Identifiers: Alfalfa plants.

Male sterility in alfalfa plants was studied during the flowering and maturation stages. More than 5000 plants were examined from which 58 showed male sterility. Crossed between male sterile and fertile plants produced several heterosis hybrids which proved superior to local types in height, foliage, disease resistance, and vigor.

2E. Animal Husbandry

AD-780 132/7GA Reprint
Armed Forces Inst of Pathology Washington D C
BLASTOMYCOSIS IN A DOG IN MARYLAND,
Peter H. Herman, and Michael A. Stedham. 1974, 3p
Availability: Pub. in Jnl. of the American Veterinary Medical Association, v164 n5 p488-489 1974.

Descriptors: *Veterinary medicine, Blastomyces, Dogs, Infectious diseases, Death, Lung, Fungus diseases, Fungi, Radiography, Pathology, Histology, Diagnosis(Medicine).
Identifiers: *Blastomycosis, *Animal diseases.

A two-year-old Bloodhound-type bitch was admitted with moderate nasal hemorrhage, pale mucous membranes, rectal temperature of 39.7C (103.5F), marked dyspnea, and pendulous abdomen. Results of microscopic fecal examination for parasite eggs and a blood test for microfilariae were negative. A fungal infection was suspected. The dog died about one hour after blood was collected for serologic testing for histoplasmosis, blastomycosis, and coccidioidomycosis. The laboratory results were not diagnostic for but were suggestive of histoplasmosis or blastomycosis. The periodic acid-Schiff (PAS) preparation, Gridley's stain for fungus, and Gomori's methenamine-silver stain demonstrated morphologic features of the organism that were characteristic of Blastomyces dermatitidis. Blastomycosis in lower animals is essentially limited to dogs; the only cases reported in other species have been six in cats, one in a horse, and one in a sea lion.

AD-780 141/8GA Reprint
Armed Forces Inst of Pathology Washington D C
HEPATIC LESIONS CAUSED BY 'CYSTICERCUS TENUICOLLIS' IN SHEEP,
G. Migaki, and D. E. Zinter. 1974, 2p
Availability: Pub. in Jnl. of the American Veterinary Medical Association, v164 n6 p618-619, 15 Mar 74.

Descriptors: *Liver, *Platyhelminths, *Parasites, *Veterinary medicine, Cysts, Larvae, Sheep, Histology, Pathology.
Identifiers: Taenia hydatigena, *Cysticercus tenuicollis.

Cysticercus tenuicollis, the larval stage of Taenia hydatigena, is usually found as relatively large, thin-walled cysts, 5 cm. or more in diameter, in the peritoneal cavity of sheep, pigs, cattle, goats, some wild animals, and some rodents such as the squirrel and hamster. After ingestion, the eggs develop into hexacanth embryos (oncospheres) in the small intestines, enter the circulation, and reach the liver of the host. In the liver, the embryos escape from the blood vessels, invade the hepatic parenchyma, and eventually reach the peritoneum, where cysticerci develop. This report is concerned with the gross and histologic lesions caused by the migration of the immature stage of Cysticercus tenuicollis in the liver of sheep.

AD-780 143/4GA Reprint
Armed Forces Inst of Pathology Washington D C
ISOLATION OF THE AVIAN RETICULOENDOTHELIAL VIRUS (STRAIN T),
F. R. Robinson, and M. J. Twiehaus. 17 Dec 73, 13p
Also pub. as Nebraska Univ., Lincoln. Agricultural Experiment Station, Journal Series Paper-3754.
Availability: Pub. in Avian Diseases, v18 n2 p278-288 Apr/Jun 74.

Descriptors: *Birds, *Poultry, *Virus diseases, Infectious diseases, Histology, Pathology, Reticuloendothelial system, Veterinary medicine, Viruses.
Identifiers: *Animal diseases, *Avian reticuloendothelial virus.

Record is made of the initial isolation and first 16 passages of the avian reticuloendotheliosis virus (strain T). The original infective liver tissue was taken from a moribund adult turkey having gross lesions similar to those of lymphoid leuosis. During the subsequent 16 passages, in which cellular inocula were used in both chicks and turkey poults, the infectious agent increased in virulence, causing nearly 100% mortality and decreases in mean survival time. Transmission with cell-free filtrates in chicks and turkey poults was demonstrated.

PB-232 675/9GA MF$1.45
National Research Council, Washington, D.C. Inst. of Lab. Animal Resources.
FISHES: GUIDELINES FOR THE BREEDING, CARE, AND MANAGEMENT OF LABORATORY ANIMALS.
Apr 74, 92p* ISBN-0-309-02213-4
Contracts NSF-C310, PH-43-64-44
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418 $5.00.

Descriptors: *Fishes, *Laboratory animals, Maintenance, Manuals, Selection, Identifying, Taxonomy, Cargo transportation, Animal nutrition, Reproduction(Biology), Management.

The report provides basic information on sources, maintenance, and use of fishes as experimental animals. It discusses the selection and use of fishes in the laboratory, suggest guidelines for uniformity, and outlines procedures for shipping live fishes, for isolation and conditioning, and for identification and control of communicable diseases. Nutrition of laboratory fishes is also discussed. The guidelines set forth in the report are intended to facilitate the maintenance of fishes in research and to increase the reproducibility of research results.

TT-71-51022 PC$3.00/MF$1.45
Agricultural Research Services, Washington, D.C.
ON THE PROBLEM OF PATHOGENESIS AND PATHOLOGICAL CHANGES IN LARGE HORNED CATTLE AFFECTED BY DEMODICOSIS (K VOPROSU O PATOGENEZE I PATOLOGICHESKIKH IZMENENIYAKH PRI DEMODEKOZE KRUPNOGO ROGATOGO SKOTA),
M. V. Krotova. 1973, 14p
Trans. of Vsesoyuznyi Nauchno-Issledovatelskii Institut Veterinarnoi Sanitarii, Moscow. Trudy (USSR) v15 p26-37 1959. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Bovines, *Skin diseases, *Ticks, Parasites, Infections, Pathology, Histology, USSR, Translations.
Identifiers: *Demodex bovis.

Demodex bovis ticks colonize in hair follicle between funnel wall and hair shaft and parasitize large horned cattle in hair follicle. As ticks multiply, a demodectic sac, ampullaceous and lined inside with flat multilayer keratinizing epithemium, is formed. The broader portion of this sac is located in thicker skin while the narrower portion forms a canal opening to skin surface. The size of demodectic tubercles that can be observed clinically and pathologically varies from 0.2 to 0.8 cm. The contents of demodectic focuses in the first, second and third stages of development are of thick pus-like consistency, yellowish or orange yellow, consisting of a large number of live and dead ticks and amorphous mass dissolving well in oils and oil solvents. As a result of the action of ticks and their toxins the wall of demodectic focus disintegrates and there is a sharp cellular reaction from the tissues of the organism. Afterward a large number of viliary nodes having a large number of giant cells is formed. These giant cells phagocytize dead ticks.

TT-72-51095 PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.
ROLE OF IZODID TICKS IN THE TRANSMISSION OF BOVINE ANAPLASMOSIS (O ROLI IKSODID V PEREDACHE VOZBUDITELYA ANAPLAZMOZA KRUPNOGO ROGATOGO SKOTA),
L. P. Artemenko. 1973, 12p
Trans. of Veterinariya (USSR) n6 p76-80 1966. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Ticks, *Animal diseases, *Anaplasma, Rickettsial diseases, Disease vectors, Parasitic diseases, Cattle, USSR, Translations.
Identifiers: Dermacentor pictus, Ixodes ricinus, Anaplasmosis.

The possibility of transmission of anaplasmosis of brovine animals under the conditions of Rovenki oblast by adult ticks Dermacentor pictus and Ixodes ricinus infested under natural conditions has been experimentally shown. A positive result has been obtained in the transmission of anaplasmosis by larvae and nymphs of these species of ticks, originating from females which were fed on animals affected seriously with anaplasmosis and on Anaplasma carrier. The transovarian transmission of anaplasmosis by the ticks of these species has also been proved by these experiments. Females of Dermacentor pictus were infected and transmitted the infection to the larvae in the case of feeding only on Anaplasma carriers.

2F. Forestry

TT-72-51107 PC$3.00/MF$1.45
Forest Service, Washington, D.C.
MICROCLIMATE IN ASPEN STANDS (O MIKROKLIMATE V OSINNIKAKH),
V. A. Alekseev. 1973, 9p

Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Lesnoi Zhurnal (USSR) n4 p7-10 1969. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Forest trees, *Microclimatology, Atmospheric temperature, Humidity, Soil properties, Temperature, Plant growth, Fungus diseases, Age, Translations, USSR.
Identifiers: Plant canopies, Aspen trees.

Many foresters report that excessive density of natural aspen stands leads to congested condition and increased humidity of air under cover and promotes the infection and development of fungous diseases. The object of the investigation was to explain the distinctive features of microclimate of main stands having varying structure, age and defects; and to determine the degree of influence of large-scale regrowth.

3. ASTRONOMY AND ASTROPHYSICS

3B. Astrophysics

AD-779 922/4GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
OBSERVATION OF H 42 ALPHA IN ORION A.
Interim rept.,
William B. Waltman, Elizabeth B. Waltman, Philip R. Schwartz, Kenneth J. Johnston, and William J. Wilson. 14 May 74, 10p Rept no. TR-0074(9230-03)6 SAMSO-TR-74-120
Contract F04701-73-C-0074

Descriptors: *Radio sources(Astronomy), Extraterrestrial radio waves, Millimeter waves, Hydrogen.
Identifiers: Orion A radio source.

The H 42 alpha (85.6884 GHz) line has been observed in Orion A and found to be stronger in intensity than non-LTE theory predicts for a spherically symmetric model H II region. (Author)

AD-780 332/3GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Physics
TENATIVE IDENTIFICATION OF THE H2O(+) ION IN COMET KOHOUTEK,
G. Herzberg, and H. Lew. 3 Jan 74, 3p
Availability: Pub. in Astronautics and Astrophysics, v31 p123-124 1974.

Descriptors: *Water, *Emission spectra, Comets, Visible spectra, Ions, Canada.
Identifiers: *Comet tails, Kohoutek comet, Astronomical spectroscopy.

Unidentified features in the spectrum of Comet Kohoutek observed by Herbig and Benvenuti and Wurm fit the low-temperature lines in the spectrum of the H2O(+) ion. The presence of this ion in the tail of Comet Kohoutek is thus strongly indicated. (Author)

COM-74-50190-355-1/GA MF$1.45
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
SOLAR-GEOPHYSICAL DATA NUMBER 355, MARCH 1974. PART I (PROMPT REPORTS). DATA FOR FEBRUARY 1974, JANUARY 1974.
Mar 74, 117p SGD-355-Pt-1 NOAA-74041702
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $30.50/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $15.50/year for either part, including extra issue. $1.25/copy for either part.

Descriptors: *Solar activity, Statistical data, Tables(Data), Solar flares, Solar radio emission, Solar x rays, Magnetic storms, Solar cosmic rays, Geomagnetism, Ionospheric disturbances, Radio transmission, Sunspots.
Identifiers: Solar protons, Pioneer 9 spacecraft, Explorer 37 satellite, Solrad 9 satellite.

Prompt reports are given on data for February 1974 and January 1974. These deal with alert periods, daily solar indices, solar flares, solar radio waves and spacecraft observations.

COM-74-50190-355-2/GA MF$1.45
National Geophysical and Solar-Terrestrial Data Center, Boulder, Colo.
SOLAR-GEOPHYSICAL DATA NUMBER 355, MARCH 1974. PART II (COMPREHENSIVE REPORTS). DATA FOR SEPTEMBER 1973, AUGUST 1973 AND MISCELLANEA.
Mar 74, 68p SGD-355-Pt-2 NOAA-74041703
Paper copy available from National Climatic Center, Attn: Publications. Federal Bldg., Asheville, N.C. 28801. Subscription $30.50/year includes Part 1 (Prompt Reports) and Part 2 (Comprehensive Reports); $15.50/year for either part, including extra issue. $1.25/copy for either part.

Descriptors: *Solar activity, Statistical data, Tables(Data), Solar flares, Sunspots, Solar radio emission, Solar x rays, Solar cosmic rays.
Identifiers: Solar protons, Explorer 37 satellite, Solrad 9 satellite.

The issue provides comprehensive data for September 1973 and August 1973 on Solar Flares, solar radio emission, selected solar noise burst, and regional flare index. It also has cosmic ray indices for December 1973.

COO-3071-51 PC$4.00/MF$1.45
Pennsylvania Univ., Philadelphia (Usa). Dept. Of Physics.
ANALYTIC PULSAR MODELS.
R. C. Adams, J. M. Cohen, R. J. Adler, and C. Sheffield. 16 Jan 74, 12p

Descriptors: (*Pulsars, *Mathematical models), (*Neutron stars, Mathematical models), Field theories, General relativity theory, Rotation.

For abstract, see NSA 29 12, number 30342.

COO-3071-66 PC$4.00/MF$1.45
Pennsylvania Univ., Philadelphia (Usa). Dept. Of Physics.
ORIGIN OF COSMIC RAYS.
J. M. Cohen, and R. Ramaty. 27 Feb 74, 6p

Descriptors: (*Primary cosmic radiation, *Origin), (*Electrons, Primary cosmic radiation), (*Protons, Primary cosmic radiation), (*Pulsars, Primary cosmic radiation), Acceleration, Supernovae.

For abstract, see NSA 29 12, number 30273.

IC-74-6 PC$5.25/MF$1.45
International Centre for Theoretical Physics, Trieste (Italy).
MODELS OF EXTRAGALACTIC RADIO SOURCES WITH A CONTINUOUS ENERGY SUPPLY FROM A CENTRAL OBJECT.
P. A. G. Scheuer. Feb 74, 45p

Descriptors: (*Cosmic radio sources, *Energy transfer), Electron beams, Intergalactic space, Mathematical models, Relativistic range, Zones.

For abstract, see NSA 29 12, number 30343.

LBL-2258 PC$13.75/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
FAR INFRARED SPECTROMETRY OF THE COSMIC BACKGROUND RADIATION.
J. C. Mather. Jan 74, 211p
Contract W-7405-eng-48

Descriptors: (*Cosmology, *Background radiation), (*Universe, *Infrared radiation), Infrared spectra, Radiation detectors.

For abstract, see NSA 29 12, number 30413.

LUIP-CR-74-1 PC$4.75/MF$1.45
Lund Univ. (Sweden). Fysiska Institutionen.
COMPOSITION OF THE COSMIC RADIATION AND THE ATOMIC PROPERTIES OF THE ELEMENTS.
K. Kristiansson. Feb 74, 31p

Descriptors: (*Primary cosmic radiation, *Chemical composition), Cross sections, Elements, Helium, Hydrogen, Interstellar grains, Ionization, Iron, Neon, Oxygen, Solar system.

For abstract, see NSA 29 12, number 30274.

SLA-74-139 PC$11.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SAFETY PLAN FOR AUSTRALIAN ECLIPSE OPERATION IN JUNE 1974.
J. H. Smelser. Mar 74, 160p

Descriptors: (*Solar corona, *Electron temperature), Australia, Eclipse, Lyman lines, Rockets, Sun.

For abstract, see NSA 29 12, number 30359.

4. ATMOSPHERIC SCIENCES

4A. Atmospheric Physics

AD-779 892/9GA PC$3.75/MF$1.45
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab
ICE CAP ANALYSIS: MECHANISMS FOR ENERGY DEPOSIT IN THE AURORAL IONOSPHERE.
Final rept.,
Robert D. Sears, John E. Evans, and Robert N. Varney. 15 Jan 74, 63p Rept no. LMSC-D358174 DNA-3293F
Contract DNA01-73-C-0224

Descriptors: *Ionosphere, *Polar regions, Aurorae, Energy, Deposition, Electrons, Heating.
Identifiers: Ice cap operation.

The purpose of the investigation is to provide analytical support to the ICE CAP program with respect to defining the possible sources of energy input to the auroral region ionosphere and their relative importance to the optical emission measurements made during Operation ICE CAP experiments. Topics discussed include: energy deposit by precipitating electrons; Joule heating; and, detection and measurement of wavelike disturbances.

AD-779 906/7GA PC$3.25/MF$1.45
Stanford Research Inst Menlo Park Calif
ORIGIN OF THE SUNSPOT MODULATION OF OZONE: ITS IMPLICATIONS FOR STRATOSPHERIC NO INJECTION.
Technical rept.,
M. A. Ruderman, and J. W. Chamberlain. Apr 74, 47p Rept no. SRI-JSR-73-8
Contract DAHC15-73-C-0370, ARPA Order-2504

Descriptors: *Stratosphere, *Ozone, Variations, Cosmic rays, Ionization, Nitrogen oxides, Explosion effects, Nuclear explosions, Supersonic transports.

The measured modulation of cosmic rays deposited in the stratosphere over a sunspot cycle produces an oscillating source of stratospheric NO with a 11-year (quasi) period. The resulting modulation of ozone over this period is calculated and is shown to give good agreement with available measurements of the time lag, the latitude depen-

dence, and the magnitude of cyclic variations of ozone. This correlated modulation is then used to predict the effect on ozone of the injection of NO into the stratosphere from artificial sources, viz., a fleet of supersonic transports and nuclear bomb explosions in the atmosphere. (Author)

AD-779 913/3GA PC$3.25/MF$1.45
Stanford Research Inst Menlo Park Calif
JOINT RADAR/SATELLITE EXPERIMENTS AT CHATANIKA, ALASKA.
Technical rept. no. 1, Oct 71-Nov 73,
Theodore M. Watt. Dec 73, 50p DNA-3305F
Contract DNA001-72-C-0076

Descriptors: *Atmospheric sounding, *Ionosphere, *Alaska, Radar signals, Incoherent scattering, Scientific satellites, Electron density, Electron energy, Energetic properties, Aurorae, Flux(Rate).
Identifiers: D region, Chatanika(Alaska), E region.

The results of joint radar/satellite experiments at Chatanika, Alaska are reported. Two types of experiments are described: (1) simultaneous observation of electron-density profiles obtained by incoherent-scatter and topside-sounding techniques, and comparison of the two sets of results; and (2) measurement of electron density and energetic particle flux, and the combination of these measurements to obtain profiles of effective recombination coefficient. The latter experiment (2) has been completed and is described in some detail. Values of effective recombination coefficient obtained by this technique compare favorably with results reported elsewhere. (Author)

AD-779 923/2GA PC$3.75/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
A GLOBAL MODEL OF THERMOSPHERIC DYNAMICS, I. WIND AND DENSITY FIELDS DERIVED FROM A PHENOMENOLOGICAL TEMPERATURE.
Interim rept.,
Stephen P. Creekmore, Joe M. Straus, Richard M. Harris, Barbara K. Ching, and Yam T. Chiu. 30 Apr 74, 63p Rept no. TR-0074(9260-06)-2 SAMSO-TR-74-117
Contract F04701-73-C-0074

Descriptors: *Upper atmosphere, *Atmosphere models, *Thermosphere, Mathematical models, Wind, Viscosity, Coriolis effect, Equations of motion, Atmospheric motion.

The paper describes the mathematical formulation and implementation of a numerical model of the upper atmosphere based on the equations of conservation of mass, momentum and energy in the altitude range 120-500 km. The model is three-dimensional and includes the effects of viscosity, ion drag, the Coriolis force and the nonlinear terms in the equations of motion. The Galerkin method is used as an efficient alternative to finite-difference approaches for the solution of three-dimensional partial differential equations. In the computations discussed here, the upper atmosphere is represented by a single fluid with molecular weight and temperature fields taken from the phenomenological model of Jacchia (1971). The horizontal and vertical wind fields and the density of the thermosphere are discussed, with particular attention to the diurnally averaged wind fields. Comparisons with previous theoretical and observational investigations are made. (Author)

AD-779 924/0GA PC$3.00/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations
ION GAUGE MEASUREMENTS OF LATITUDINAL DENSITY VARIATIONS AT NIGHT.
Interim rept.,
Barbara K. Ching, and Virginia L. Carter. 14 May 74, 18p Rept no. TR-0074(4260-10)-10 SAMSO-TR-74-119
Contract F04701-73-C-0074

Descriptors: *Atmospheric density, *Upper atmosphere, Night sky, Scientific satellites.
Identifiers: OGO-6 satellite.

Atmospheric densities have been obtained from a cold cathode ion gauge flown on the satellite 1972-32A in April-May 1972. The satellite orbit was inclined at 81.5 degrees in a noon-midnight configuration. Data obtained at heights between 200 and 275 km during a very quiet period have been examined for latitudinal effects. Transformed to a constant altitude of 230 km, the data show a variation on the dark side by as much as a factor of 2, the highest density being at high northern latitudes and the lowest at middle to high southern latitudes. General agreement was obtained between the data and both the Jacchia 1971 and OGO-6 models. An equatorial maximum was sometimes observed that closely resembled the pure N2-distribution as described by the OGO-6 model. (Author)

AD-780 063/4GA PC$3.25/MF$1.45
Army Electronics Command Fort Monmouth N J
AEROSOL ANGULAR SCATTERING FUNCTIONS FOR MODEL ATMOSPHERES.
Research and development technical rept.,
Israel Cantor. May 74, 26p Rept no. ECOM-5540

Descriptors: *Atmosphere models, *Aerosols, *Light scattering, Light transmission, Visibility, Tables(Data).
Identifiers: Atmospheric attenuation.

A new set of tables is derived (as a function of wavelength, scattering angle, meteorological range, and size parameter), providing values of the aerosol angular scattering functions for the Elterman clear standard and hazy model atmospheres with an effective refractive index of 1.5. The selected wavelengths for each size parameter are 0.40, 0.45, 0.55, 0.65, 0.85, 1.0, and 1.2 micrometers; the scattering angles for each wavelength are 1, 4, 7, 10, 30, 60, 80, 90, 110, 120, 130, 150, and 180 degrees; the meteorological ranges for each wavelength are 23, 13, 10, 8, 6, 5, 4, 3, and 2 km, and the size parameters selected 2.5 and 4.0, represent the lower and upper limits in the Junge power law size distribution. These tables will facilitate angular scattering calculations in the field of optical propagation through the atmosphere. (Author)

AD-780 208/5GA PC$4.50/MF$1.45
Navy Weather Research Facility Norfolk Va
USE OF ISOGON: ISOVEL CHARTS AND THE ISOGON-DEVIATION FIELD IN FORECASTING ATMOSPHERIC TURBULENCE,
J. Robert Stinson, and Steven H. Cohen. 6 Jul 65, 30p

Descriptors: *Clear air turbulence, *Weather forecasting, Wind direction, Wind velocity, Patterns, Meteorological charts.
Identifiers: Isogon charts, Isovel charts.

The use of Isogon-Isovel charts and the Isogen-Deviation Field in forecasting atmospheric turbulence shows considerable promise. In the present study the verifications were far from perfect but are considered to be quite good in view of the fact that the charts represent an instantaneous field at one level only and the turbulence reports cover a 12 hour period during which time the streamline divergence and convergence patterns sweep out considerable areas. No corrections for synoptic pattern stability or other criteria were made.

AD-780 276/2GA PC$5.00/MF$1.45
Battelle Pacific Northwest Labs Richland Wash
WAVE-PARTICLE INTERACTIONS IN THE MAGNETOSPHERIC PLASMA.
Final rept.,
Michael Schulz. 15 Apr 74, 161p
Contract N00014-73-C-0333, ARPA Order-2141
Prepared in cooperation with Aerospace Corp., El Segundo, Calif. Lab. Operations. Rept. no. ATR-74(7420)-1.

Descriptors: *Magnetosphere, *Plasmas(Physics), Atmospheric physics, Charged particles, Plasma oscillations, Interactions.
Identifiers: Wave particle interactions, Magnetospheric modification.

Contents:
- Crude approximations to some aspects of three-dimensional magnetospheric dynamics;
- Effect of instabilities on ring current;
- Evaluation of limit on stably trapped particle flux;
- Particle lifetimes in strong diffusion;
- Particle saturation of the outer zone;
- Trapping of particles by waves in a non-uniform plasma;
- Phase-integral approximation of Pc-4 eigenfrequencies;
- Necessary conditions for bounce-resonant wave amplification;
- Electromagnetic radiation from a helically phased particle beam;
- Computer simulation of an ion beam antenna;
- Radiation from a line source carrying a traveling wave in a magnetoplasma.

AD-780 302/6GA PC$6.50/MF$1.45
Pennsylvania State Univ University Park Ionosphere Research Lab
EFFECT OF ENERGETIC ATOMIC OXYGEN AND NITROGEN ON NEUTRAL DENSITY MODELS.
Scientific rept.,
Ronald P. Rohrbaugh. 2 Apr 74, 70p Rept no. PSU-IRL-SCI-423
Contract N00014-67-A-0385-0017, Grant NGL-39-009-003

Descriptors: *Oxygen, *Nitrogen, *Nitrogen oxides, *Aeronomy, *Ionosphere, Transport properties, Kinetic energy, Density, Atoms, Ions, Particle collisions, Energy transfer, Distribution, Trajectories.
Identifiers: *Dissociative recombination, F region, Oxygen atoms, Nitrogen atoms.

The dissociative recombination of O2(+), NO(+), and N2(+) in the F-region results in the production of atomic oxygen and nitrogen with substantially greater kinetic energy than the ambient atoms. A distribution technique is used to determine the amount of these energetic atoms that are capable of reaching exospheric altitudes from the collision-dominated region at which they are produced. The ballistic trajectories are then calculated in the spherical gravitational field of the earth to study their vertical and horizontal redistribution. In general, the high altitude densities are shown to be substantially greater than those predicted by diffusive equilibrium and a nighttime heating source results from the transport of the energetic atoms from the daytime to the nighttime hemisphere. However, this heating source is negligible in comparison to the major heating mechanisms of the nighttime regions. (Author)

AD-780 303/4GA Reprint
Litton Systems Inc Minneapolis Minn Applied Science Div
AIRCRAFT MEASUREMENTS OF AIR WEATHER ELECTRIC FIELD NOISE WITHIN THE AUSTAUSCH LAYER,
Douglas A. Kohl. 22 Nov 67, 9p
Contract N00014-67-C-0532
Revision of report dated 21 Aug 67.
Availability: Pub. in Jnl. of Geophysical Research, v73 n6 p1913-1919, 15 Mar 68.

Descriptors: *Atmospheric electricity, *Electric fields, Low altitude, Sunlight, Space charge.

A trailing wire antenna was used as a sensor for airborne measurements of weak atmospheric electric fields in the 60- to 3000-mv/m range. This technique provided plus or minus 30-volt antenna signals from horizontal components of fields produced by fair weather space-charge concentra-

tions within the austausch layer. The average separation of charge centers was 536 meters. The maximum space-charge density detected was 6.3 X 10 to the minus 11th power coulomb/cubic meter. The weak fields were found to be strongly dependent on direct solar input to the atmosphere and broadly distributed in both altitude and distance within the austausch layer only. (Author)

AD-780 384/4GA Reprint
Michigan Univ Ann Arbor Dept of Aerospace Engineering
ON THE THEORY OF NOCTURNAL ELF EMISSIONS.
Interim rept.,
M. Y. Uy, and R. S. B. Ong. 26 Jan 73, 4p AFOSR-TR-74-0829
Grant AF-AFOSR-2224-72
Availability: Pub. in Physica Scripta, v9 p67-68 1974.

Descriptors: *Ionosphere, Night, Emission, Extremely low frequency.
Identifiers: *Nocturnal emissions.

Continuous nocturnal sub-ELF emissions are explained in terms of the excitation of drift waves in the ionosphere. A simplified model of the ionosphere is used in the calculations. The results are in good agreement with observations. (Author)

AD-780 433/9GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
GEOPHYSICAL ASPECTS OF ATMOSPHERIC REFRACTION.
Final rept.,
Charles G. Purves. 7 Jun 74, 45p Rept no. NRL-7725

Descriptors: *Atmospheric refraction, *Radar reflections, Forecasting, Radar signals, Radio waves, Refractive index.
Identifiers: Spaceborne photography.

The purpose of this paper is to discuss some of the geophysical aspects of atmospheric refraction and its effect on radars. Of special concern is the cause-and-effect relationships associated with the trapping of electromagnetic energy into atmospheric duct layers that result in anomalous propagation conditions and extend radar ranges far beyond the normal radar horizon.

AD-780 478/4GA Reprint
Panametrics Inc Waltham Mass
THE REAL-TIME DETERMINATION OF IONOSPHERIC CURRENT PARAMETERS DURING A SUBSTORM,
Frederick A. Hanser, Bach Sellers, and Roger P. Vancour. 10 Aug 73, 13p AFCRL-TR-0219
Contract F19628-70-C-0224
Revision of report dated 28 Mar 73.
Availability: Pub. in Jnl. of Geomagnetism and Geoelectricity, v25 p339-348 1973.

Descriptors: *Ionosphere, *Electric current, Ionospheric disturbances, Magnetic disturbances, Magnetometers, Data processing, Real time.
Identifiers: *Electrojets.

Data from three-axis magnetometers situated at two different locatons on a north-south line from Churchill were fed into a PDP-8 computer at Churchill. The altitude, horizontal position and intensity of the polar electrojet were determined in real time to select the optimum launch time for rockets used to study auroral phenomena associated with substorms. During the two substorms studied, the jet was located near 140 km altitude and the intensity of each was as high as 0.5 megaamps. In one case, both stations gave results similar to the two station fit, so the jet was well approximated by a line current. In the second case, the data suggest that the current was either a sheet current or a group of filaments. (Author)

AD-780 479/2GA Reprint
Texas Univ Dallas
POLAR CAP AURORAL ELECTRON FLUXES OBSERVED WITH ISIS 1,
J. D. Winningham, and W. J. Heikkila. 27 Nov 73, 12p AFCRL-TR-74-0238
Contracts F19628-72-C-0230, NAS5-9112
Revision of report dated 13 Apr 72.
Availability: Pub. in Jnl. of Geophysical Research, v79 n7 p949-957, 1 Mar 74.

Descriptors: *Aurorae, *Particle flux, Polar cap absorption, Ionospheric disturbances, Scientific satellites, Electrons.
Identifiers: Isis-1 satellite.

Three types of auroral particle precipitation have been observed over the polar caps, well inside the auroral oval, by means of the soft particle spectrometer on the Isis 1 satellite. The first type is a uniform, very soft (approximately 100 eV) electron 'polar rain' over the entire polar cap; this may well be present with very weak intensity at all times, but it is markedly enhanced during worldwide geomagnetic storms. A second type of precipitation is a structured flux of electrons with energies near one keV, suggestive of localized 'polar showers'; it seems likely that these are the cause of the sun-aligned auroral arcs that have been observed during moderately quiet conditions. During periods of intense magnetic disturbance this precipitation can become very intense and exhibit a characteristic pattern that we have come to call a 'polar squall'. (Modified author abstract)

AD-780 487/5GA Reprint
Princeton Univ N J Plasma Physics Lab
PARAMETRIC INSTABILITIES AND IONOSPHERIC MODIFICATION,
F. W. Perkins, C. Oberman, and E. J. Valeo. 28 Nov 73, 22p Rept no. PPL-AP-69 AFOSR-TR-74-0886
Contracts F44620-73-C-0026, F30602-73-C-0163
Sponsored in part by Contract F44620-70-C-0033.
Revision of Report dated 28 Jun 73.
Availability: Pub. in Jnl. of Geophysical Research, v79 n10 p1478-1496, 1 Apr 74.

Descriptors: *Ionospheric propagation, *Ionospheric disturbances, Plasma oscillations, Heating, Radiofrequency power.
Identifiers: *Ionospheric modification.

The plan of the paper is as follows. Section 1 reviews and extends the linear theory of parametric instabilities in uniform plasma including the effects of a magnetic field. Section 2 calculates the nonlinear saturation of the parametric instability in a two-dimensional uniform plasma model. The effects of nonuniformity and plasma wave refraction are assessed in section 3. Nonlinear energy absorption is the topic of section 4, and section 5 calculates the electromagnetic wave scattering produced by the nonlinear spectrum of sections 2 and 3. The paper concludes with a discussion and suggestions for new aeronomy experiments made possible by ionospheric modification techniques.

AD-780 502/1GA PC$4.00/MF$1.45
Athens Univ (Greece) Electronic Div
THE TOTAL ELECTRON CONTENT MEASUREMENTS FROM ATHENS - GREECE STATION.
Final rept. 1 Mar-1 Dec 70,
Michael A. Anastassiadis. 31 Jan 71, 20p AFCRL-TR-74-0242
Contract F61052-70-C-0012

Descriptors: *Ionosphere, *Electron density, Diurnal variations, Seasonal variations, Scientific satellites, Ionization, Greece.
Identifiers: F 2 region, S-66 satellite, Explorer 22 satellite.

The diurnal and seasonal variations of ionospheric total electron content were studied during 1966, using signals from the Explorer 22 satellite.

AD-780 519/5GA PC$3.75/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
MILLSTONE HILL RADAR PROPAGATION STUDY: SCIENTIFIC RESULTS. PART III.
Technical rept.,
John V. Evans. 13 Nov 73, 73p Rept no. TR-509 ESD-TR-73-261
Contract F19628-73-C-0002
Prepared in cooperation with Bell Telephone Labs., Inc., Murray Hill, N.J. Contract DAHC60-71-C-0005. See also AD-779 689.

Descriptors: *Atmospheric sounding, *Ionospheric disturbances, Aurorae, Radar cross sections, Ionospheric propagation, Magnetic disturbances, Scintillation.

Contents:
High-latitude ionospheric disturbances;
Auroral returns;
Models for transient phenomena.

AD-780 522/9GA PC$4.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
MORPHOLOGY OF IONOSPHERIC SCINTILLATION.
Technical note,
Robert K. Crane. 21 May 74, 89p Rept no. TN-1974-29 ESD-TR-74-212
Contract F19628-73-C-0002

Descriptors: *Ionospheric propagation, *Scintillation, Radiofrequency interference, Ionospheric disturbances, Electron density, Ultrahigh frequency, Very high frequency.

The report is directed toward providing information to communication systems designers first about scintillation as observed in a single experiment, second about the adequacy of the existing models used to interpret scintillation data, and finally about the variation of scintillation with geophysical parameters.

AD-780 526/0GA PC$3.25/MF$1.45
Munich Univ (West Germany) Meteorologisches Institut
SPECTRAL RADIATION PROPERTIES OF THE ATMOSPHERE AND THE EARTH. PROFILES OF WATER VAPOR AND METHANE MIXING RATIOS FROM MEASUREMENTS WITH BALLOON BORNE INSTRUMENTS.
Final scientific rept.,
Peter Burkert, Dieter Rabus, and Hans-Jurgen Bolle. Dec 73, 30p AFCRL-TR-74-0240
Grant AF-AFOSR-2282-72

Descriptors: *Stratosphere, *Water vapor, *Methane, Atmospheric physics, Mixing, Radiometry, Atmospheric sounding, West Germany.

In previous reports a two channel filter radiometer has been described to be used for the determination of mixing ratios of minor constituents in the stratosphere from aboard a balloon or a sounding rocket. Two of these instruments were flown in a balloon on April 5, 1971. Besides testing the instruments the intention was to develop and test evaluation techniques for the transmission data from the instruments and get a first value of mixing ratio for water vapor and methane in the lower stratosphere. Evaluation techniques are described and water vapor and methane profiles between 12 and 30 km altitude are shown which were derived from the data of this balloon flight. (Author)

COM-74-11108/9GA PC$4.00/MF$1.45
National Environmental Satellite Service, Washington, D.C.
PUBLICATIONS AND FINAL REPORTS ON CONTRACTS AND GRANTS, 1973 - NESS.
Technical memo.
Apr 74, 15p NOAA-TM-NESS-55 NOAA-74051506

Descriptors: *Atmospheric physics, *Meteorology, *Bibliographies, Meteorological satellites, Scientific satellites, Meteorological radar, Remote sensing, Weather forecasting, Sea ice, Oceanography.
Identifiers: National Environmental Satellite Service.

The memorandum is one of a series containing lists of articles and reports published by or for the National Environmental Satellite Service. To date the series consists of NESC TM 1 (for 1958-66), 2 (1967), 11 (1968), 22 (1969), 31 (1970), 38 (1971), and 46 (1972). This issue lists items published or received during 1973 and includes items omitted from previous issues.

4B. Meteorology

AD-779 880/4GA PC$3.25/MF$1.45
Geomet Inc Rockville Md
VALIDATION STUDY OF A TWO DIMENSIONAL WARM FOG MODIFICATION MODEL.
Final rept.,
Demetrios J. Moschandreas. 17 May 74, 36p Rept no. GEOMET-EF-321
Contract N00014-71-C-0271

Descriptors: *Fog, *Weather modification, Hygroscopicity, Particles, Visibility, Drops, Sizes(Dimensions), Wind, Two dimensional, Mathematical models, Condensation, Nucleation, Chambers, Experimental data.
Identifiers: *Fog dispersal.

The objective of the project is to perform the necessary research to investigate the validity and/or the range of applicability of the GEOMET two dimensional warm fog modification model. This validation project is to be conducted on the basis of existing results of the two dimensional model and published data from field and chamber experiments. The analysis and classification of the regular tasks involved in a warm fog modification operational use project will be investigated.

AD-780 084/0GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
A HIGH RESOLUTION TEMPERATURE SONDE FOR THE LOWER ATMOSPHERE.
Research and development technical rept.,
Ricardo Pena, and Harry N. Schwartz. May 74, 22p Rept no. ECOM-5541

Descriptors: *Atmospheric temperature, *Temperature measuring instruments, Radiosondes, Calibration, High resolution.
Identifiers: Lower atmosphere.

The paper describes a High Resolution Temperature Sonde (HRTS), developed by the Atmospheric Sciences Laboratory (ASL), and compares lower atmospheric temperature profiles measured by the HRTS to the same profiles measured by the standard radiosonde. Data from solid-state, lightweight HRTS's flown on jimsphere balloons and tracked by a T-9 radar to provide altitude information, are discussed. Instrumentation associated with and calibration related to the HRTS are described. (Modified author abstract)

AD-780 121/0GA PC$4.00/MF$1.45
R and D Associates Santa Monica Calif
HISTORICAL CLIMATOLOGY.
Final technical rept.,
Leona M. Libby. Feb 74, 95p Rept no. RDA-TR-2901-001 AFOSR-TR-74-0821
Contract F44620-73-C-0029, ARPA Order-1964
See also report dated Oct 72, AD-757 225.

Descriptors: *Climate, *Geochemistry, Temperature, Trees, Isotope availability, Neutron activation, Organic materials, Oxygen, Carbon, Hydrogen.
Identifiers: *Paleoclimatology, Radiocarbon dating, Tree ring analysis.

A methodology for evaluation of past climates in historic times has been examined from a theoretical basis and its evaluation has been initiated. The principle is that the ratios of stable isotopes in a tree depend on the temperature at which its wood is manufactured as well as on the temperature at which precipitation, which nourishes the tree is produced. By measuring stable isotope ratios in a chronological sequence of dated tree rings, changes in climate may be evaluated. A tree has been so measured for the years 1700-1950 and compared with the thermometer record for those years to obtain phenomenological (numerical) temperature coefficients for the ratios of hydrogen, carbon, and oxygen. A second tree has been measured for the years 1500-1800 and found to show the low temperatures of the Little Ice Age with warm brief intervals at about 1570, 1650, 1730 and 1790. A theoretical study of various aspects of the total carbon inventory on the earth's surface has been initiated. (Author)

AD-780 269/3GA PC$3.25/MF$1.45
Navy Weather Research Facility Norfolk Va
A TECHNIQUE FOR PREDICTING SOUTH CHINA SEA TROPICAL CYCLONES.
Technical paper,
L. R. Brody, and J. D. Jarrell. May 69, 31p Rept no. NAVWEARSCHFAC-TP-8-69

Descriptors: *Tropical cyclones, *Weather forecasting, *South China Sea, Estimates, Wind velocity, Motion, Meteorological charts, Tables(Data).
Identifiers: Cyclogenesis, Easterlies.

The low-level cyclonic shear zone in the South China Sea is investigated as a possible precursor of tropical storm activity within the South China Sea. For tropical storm genesis in this area, it is shown that the strength of the cyclonic shear zone reaches a critical intensity approximately 24 to 48 hours before cyclogenesis takes place. Also, if the cyclonic shear zone is not present and there is either a large-scale ridge or easterly flow across the South China Sea, then tropical storm genesis does not take place for at least a week. With respect to tropical storms approaching the South China Sea from the Philippine Sea, the presence of a cyclonic shear zone is a good indication that the tropical storm will move into the area. On the other hand, when a large-scale low-level ridge is present over the area, these storm recurve northward and will not enter the South China Sea. (Author)

AD-780 273/9GA PC$4.00/MF$1.45
Bohan (Walter A) Co Park Ridge Ill
STRATOSPHERIC CIRCULATION STUDY: ROLE OF THE SUBTROPICAL JET STREAM IN TROPOSPHERE/STRATOSPHERE TELECONNECTIONS.
Final rept.,
Walter A. Bohan. Aug 71, 16p
Contract N00014-70-C-0408

Descriptors: *Jet streams, *Stratosphere, *Atmospheric circulation, Troposphere, Atmospheric temperature, Barometric pressure, Wind velocity, Patterns, Atmospheric sounding.

During the late winter months when the subtropical jet stream reaches its maximum intensity, confluence patterns develop between the subtropical and polar-front jet streams. Through the increased vertical velocities and vorticity production, teleconnections between the tropospheric Ferrel westerlies and the stratospheric polar-night westerlies becomes possible. This can cause a disruption of the circular pattern of the polar-night vortex and result in the development of large-amplitude wave trains which precede the occurrence of sudden stratospheric warming events. (Author)

AD-780 282/0GA PC$4.00/MF$1.45
Edaw Inc San Francisco Calif
CLIMATIC DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 18p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 283.

Descriptors: *Climate, *Texas, Global communication systems, Extremely low frequency, Sites, Atmospheric precipitation, Atmospheric temperature, Snow, Humidity, Wind, Thunderstorms, Tables(Data).
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area amd is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 291/1GA PC$4.25/MF$1.45
Edaw Inc San Francisco Calif
CLIMATIC DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 25p
Sponsored in part by Naval Facilities Engineering Command Philadelphia, Pa. Northern Div. See also AD-780 292.

Descriptors: *Climate, *Michigan, Global communication systems, Sites, Atmospheric temperature, Snow, Atmospheric precipitation, Thunderstorms, Humidity, Freezing, Extremely low frequency.
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 298/6GA PC$4.50/MF$1.45
Texas Univ El Paso Schellenger Research Labs
ANALYSIS OF DATA IN SUPPORT OF PROJECT SABAR (BLNS).
Final rept. 1 Apr 71-31 Mar 73,
Robert Acosta, and Kathy Hampson. 18 May 73, 28p AFCRL-TR-73-0296
Contract F19628-71-C-0160

Descriptors: *Meteorological balloons, *Trajectories, Flight paths, Meteorological data, Data reduction, Feasibility studies, Stratosphere, Wind velocity.
Identifiers: SABAR project.

The objective of the contract was to provide computational and analytical services in conjunction with studies concerning the feasibility of flight trajectories. Post-flight analyses of stratospheric balloon programs consisted of transcribing, analyzing, graphing, and providing mathematical computations from graphical data furnished by the Government. During the span of the Contract, eighteen studies were assigned numbered 68 through 85. (Author)

AD-780 313/3GA PC$9.75/MF$1.45
National Climatic Center Asheville N C
U.S. NAVAL WEATHER SERVICE COMMAND SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS - EAST AFRICAN AND SELECTED ISLAND COASTAL MARINE AREAS. VOLUME 1. AREA 1 - KURIA MURIA

ISLANDS, AREA 2 - WEST ARABIAN SEA, AREA 3 - QAMR BAY, AREA 4 - SOCOTRA ISLAND, AREA 5 - GULF OF ADEN, NE, AREA 6 - GULF OF ADEN, NW.
Jun 74, 482p
See also Volume 3, AD-780 314.

Descriptors: *Marine meteorology, *Coastal regions, *Africa, *Indian Ocean Islands, Meteorological phenomena, Air water interactions, Climate, Atmospheric precipitation, Fog, Cloud cover, Visibility, Ocean waves, Atmospheric temperature, Tables(Data).
Identifiers: *Kuria Muria Islands, *Arabian Sea, *Qamr Bay, *Socotra Island, *Aden Gulf.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries.

AD-780 314/1GA PC$9.75/MF$1.45
National Climatic Center Asheville N C
U.S. NAVAL WEATHER SERVICE COMMAND SUMMARY OF SYNOPTIC METEOROLOGICAL OBSERVATIONS - EAST AFRICAN AND SELECTED ISLAND COASTAL MARINE AREAS. VOLUME 3. AREA 13 - GULF OF ADEN, SW, AREA 14 - GULF OF ADEN, SE, AREA 15 - SOMALI COAST, NE, AREA 16 - SOMALI COAST EAST, AREA 17 - SOMALI COAST, SE, AREA 18 - SOMALI COAST SOUTH.
Jun 74, 483p
See also Volume 1, AD-780 313.

Descriptors: *Marine meteorology, *Coastal regions, *Africa, Meteorological phenomena, Air water interactions, Climate, Atmospheric precipitation, Fog, Cloud cover, Visibility, Ocean waves, Atmospheric temperature, Tables(Data).
Identifiers: *Aden Gulf, *Somali Republic.

The data contained in these tables were obtained from tape data Family 11 (TDF-11), Marine Surface observations. TDF-11 was primarily funded by the Naval Weather Service Command and selected by NWSED Asheville as the most comprehensive collection of marine surface observations from which to develop a series of coastal marine summaries.

AD-780 423/0GA PC$8.25/MF$1.45
Ocean Data Systems Inc Rockville Md
SURVEY OF PACIFIC THEATRE SATELLITE DATA USERS.
Final technical rept. Dec 73-Apr 74,
William E. Hubert. 18 Apr 74, 102p Rept no. ODSI-670 EPRF-TR-3-74(ODSI)
Contract N66314-74-C-1266

Descriptors: *Meteorological satellites, *Meteorological data, *Data processing, *Pacific Ocean, User needs, Reviews.
Identifiers: SATDAT(SATellite DATa processing system), Satellite data processing system.

Results of a survey of Pacific theatre users of satellite data to obtain input to the Satellite Data Processing System (SATDAT) are reported. These results will support the planning of Naval Air Systems Command and Naval Weather Service for satellite data processing and applications, satellite imagery and derived product development, communications requirements, and display device development. It is shown that a need exists for the use of satellite data to improve atmospheric analysis and prediction. (Author)

AD-780 427/1GA PC$3.25/MF$1.45
Naval Electronics Lab Center San Diego Calif
ATMOSPHERIC STRUCTURE OBSERVED BY FM-CW RADAR AT THE SALTON SEA IN THE CALIFORNIA DESERT.
Research and development rept. Aug 72-Jul 73,
D. R. Jensen, V. R. Noonkester, and J. H. Richter. 11 Mar 74, 32p Rept no. NELC-TR-1915

Descriptors: *Atmospheric sounding, *Radar cross sections, Continuous wave radar, Frequency modulation, Radiosondes, Convection(Atmospheric), Atmospheric motion, Rain, Insects.
Identifiers: *Lower atmosphere, *Remote sensing, Salton Sea.

The observational results of a scanning mobile FM-CW radar sounder, operated in an arid environment at the Salton Sea Navy Base, California, for a period of five days, are reported. The returns are compared with returns taken with a fixed (vertically pointing) FM-CW radar sounder operating in a marine environment in San Diego, California. Echoes obtained at Salton Sea were found to be predominately low-level, surface-based, convective-like structures apparently resulting from vertical mixing induced by daytime surface heating. Relatively few elevated layers were observed during the short measurement period in the arid environment as compared to observations in San Diego. Waves resembling K-H instabilities were observed. Insect flight patterns were found to be influenced by atmospheric structure and may be used as tracers for vertical atmospheric motion. Multiple layering showing wave motions was also observed and is common to both environments. These radar findings were supported by simultaneous radiosondes. (Author)

COM-74-11094/1GA PC$4.00/MF$1.45
National Oceanic and Atmospheric Administration, Washington, D.C. Federal Coordinator for Meteorological Services and Supporting Research.
FEDERAL PLANS FOR COOPERATIVE BACKUP FOR SEVERE LOCAL STORMS AND AVIATION WINDS FORECASTS,
Clayton E. Jensen. Jan 74, 13p FCM-74-2 NOAA-74051507

Descriptors: *Storms, *Weather forecasting, *Aviation safety, Wind(Meteorology), Planning, Tornadoes, Thunderstorms.
Identifiers: Severe storms.

The set of Federal plans describes cooperative ventures involving civil and military meteorological services. It contains two of several backup plans for meteorological centers. The set of plans arranges the emergency backup for the: (a) Preparation and issuance of severe local storm watches of the National Weather Service's Severe Storms Forecast Center at Kansas City, Mo., by the Air Force Global Weather Central at Offutt Air Force Base, Neb.; and (b) preparation and issuance of the digital aviation wind forecasts of the National Weather Service's National Meteorological Center at Suitland, Md., by the Air Force Global Weather Central.

COM-74-11096/6GA PC$4.50/MF$1.45
National Meteorological Center, Washington, D.C.
STATUS REPORT ON A SEMI-IMPLICIT VERSION OF THE SHUMAN-HOVERMALE MODEL.
Technical memo.,
Kenneth A. Campana. Mar 74, 28p NOAA-TM-NWS-NMC-54 NOAA-74050801

Descriptors: *Weather forecasting, *Numerical analysis, Partial differential equations, Numerical integration.
Identifiers: *Numerical weather forecasting.

The numerical weather prediction model developed by Shuman and Hovermale has been reformulated for semi-implicit integration. Early results of real data experimentation with the new model are presented in the paper. Orography, friction, and diabatic effects are not treated in this model. Successful forecasts have been made to 48 hours that compare favorably with results from a parallel explicit integration.

COM-74-11098/2GA PC$3.00/MF$1.45
Purdue Univ., Lafayette, Ind. Dept. of Geosciences.
SEVERE LOCAL STORMS RESEARCH AT PURDUE UNIVERSITY.
Final rept. 1 Sep 72-31 Aug 73,
Ernest M. Agee, and Thomas A. Schroeder. 12 Mar 74, 16p NOAA-74051425
Grant NOAA-043-022-20, NOAA-044-022-5

Descriptors: *Tornadoes, *Indiana, Thunderstorms, Squalls, Intensity.
Identifiers: Synoptic meteorology.

As a part of the study severe local storms, the report presents an outline of the problem area selected and the progress made in enhancing the knowledge and understanding in this area of severe storm dynamics. On 14 May 1972 a strong tornado occurred on the east side of Indianopolis, IN. There was a remarkable evolution of a squall line wave pattern and associated severe thunderstorm activity. Close analysis of the synoptic weather pattern responsible for this severe storm outbreak and calculations of severe storm indices revealed no quantitative explanation for the degree of severity achieved.

COM-74-11100/6GA PC$3.00/MF$1.45
New York Univ., Bronx. Dept. of Meteorology and Oceanography.
SEVERE STORMS.
Final rept.,
James E. Miller, and Harvey L. Moskowitz. 1973, 16p NOAA-74051426
Contract NOAA-E22-101-70(G)

Descriptors: *Storms, *Jet streams(Meteorology), *Tropical regions, Tornadoes, Hurricanes, Wind velocity, Advection, Cooling.

Tornadoes associated with hurricanes occur when differential advection is present in a nearly unstable atmosphere. An objective analysis scheme which could accurately and quickly determine the presence of differential advection is developed. Finally, an investigation of the role of jet streams in severe storms is performed. It was found theoretically that local variation of flow resulting from rapid changes of geostrophic wind speed or inertial instability can produce cold advection. The cold advection occurs in regions which often have severe storms. An analysis of the National Severe Storms Laboratory mesonetwork data for 1968 and 1969 shows that although inertial instability was present in the network, local deviations in wind direction and cold advection were not detected. (Modified author abstract)

COM-74-11109/7GA PC$4.75/MF$1.45
National Oceanic and Atmospheric Administration, Boulder, Colo. Wave Propagation Lab.
THE NOAA OPTICAL SYSTEM FOR MEASURING AVERAGE WIND.
Technical memo.,
G. R. Ochs, and G. F. Miller. Jul 73, 31p NOAA-TM-ERL-WPL-9 NOAA-74042902
Sponsored in part by Army Electronics Command, White Sands, N.M. Atmospheric Sciences Lab.

Descriptors: *Wind(Meteorology), *Optical measuring instruments, *Meteorological instruments, Optical measurement, Transmitter receivers, Helium neon lasers, Circuits, Wiring diagrams, Calibrating.

The NOAA optical system for measuring average wind is described. Circuit diagrams and adjustment instructions for the instrument are included.

COM-74-11118/8GA PC$4.75/MF$1.45
National Weather Service, Silver Spring, Md.

NUMERICAL WEATHER PREDICTION ACTIVITIES, NATIONAL METEOROLOGICAL CENTER, SECOND HALF OF 1973.
Apr 74, 33p NOAA-74042604
See also report dated Sep 73, COM-73-11925.

Descriptors: *Weather forecasting, Data processing, Hurricanes, Meteorological radar, Mathematical models, Numerical analysis.
Identifiers: *Numerical weather forecasting, IBM 360/195 computers.

The report summarizes the NWP activities of the NMC for the second half of 1973. There were no significant changes made to the operational models during this period. Major efforts are being directed toward converting the operational programs to the new IBM 360/195 computer system acquired by NOAA. Preliminary activities in the new hurricane modeling project and results of the VTPR test are reported. Charts are included which show forecast verification-monthly means for 1973.

COM-74-11119/6GA PC$6.50/MF$1.45
National Oceanic and Atmospheric Administration, Boulder, Colo. Weather Modification Program Office.
FLORIDA AREA CUMULUS EXPERIMENT (FACE) OPERATIONAL AND PRELIMINARY SUMMARY (1973).
Technical memo.
Mar 74, 260p NOAA-TM-ERL-WMPO-12 NOAA-74050806

Descriptors: *Cloud seeding, *Cumulus clouds, *Florida, Cloud physics, Raindrops, Meteorological satellites, Meteorological data, Rainfall.
Identifiers: Florida area cumulus experiment.

The experimental period was the 94 days between 11 June and 12 September 1973, in a 4800 square mile target area just northwest of Miami, FL. The core program consisted of randomized (by days) dynamic seeding of cumulus groups in the target, with rain volume measured by the calibrated digitized 10-cm operational WSR-57 radar of the National Weather Service. Subprograms consisted of new airborne cloud physics measurements on the seeder aircraft, a cloud base aircraft investigating raindrop size and composition and measuring fluxes in the boundary layer, extensive surface networks measuring rainfall, wind and temperature, mobile surface rainwater collection and analysis of seeded and unseeded rain. The document summarizes the operational phases of the core program and each of the subprograms and presents preliminary results where available. The surface rainwater sub-program was particularly successful; it obtained 45 samples in seeded rain and 105 in unseeded rain. (Modified author abstract)

COM-74-50359-04/GA MF$1.45
World Data Center A, Asheville, N.C. Meteorology.
HIGH ALTITUDE METEOROLOGICAL DATA. INTERNATIONAL DELAYED DATA ISSUE. VOLUME NUMBER 4, MOBILE SHIP DATA, U.S.S.R.
Data rept.
1973, 208p NOAA-74041706
Paper copy available from National Climatic Center, Federal Bldg., Asheville, N.C. 28801. Attn: Publications. $36.00/year, $3.00/copy.

Descriptors: *Meteorological data, *Atmospheric sounding, Marine meteorology, Wind(Meteorology), Tables(Data), Seasonal variations, Statistical analysis, Atmospheric pressure, Atmospheric density, Sound transmission, Acoustic velocity.

The high altitude meteorological data reports (formerly meteorological rocket network firings) are issued monthly by World Data Center A for meteorology. Each report contains the wind and temperature measurements from all available high altitude meteorological sounding data for that particular month, along with computed values for pressure, density, and speed of sound. The local rawinsonde observation nearest the time of the high altitude meteorological sounding is also included when available. Statistical tables and graphs of current month means and standard deviations for all parameters with long-term means for the same month are presented immediately following the monthly observations. A brief monthly summary designed to compare the current month's means with the long-term means introduces this section of the publication.

COM-74-50359-05/GA MF$1.45
World Data Center A, Asheville, N.C.
HIGH ALTITUDE METEOROLOGICAL DATA. INTERNATIONAL DELAYED DATA ISSUE. VOLUME NUMBER 5, 1973.
Data rept.
1973, 210p NOAA-74041707
Paper copy available from National Climatic Center, Federal Bldg., Asheville, N.C. 28801. Attn: Publications. $36.00/year, $3.00/copy.

Descriptors: *Meteorological data, *Atmospheric sounding, Wind(Meteorology), Atmospheric temperature, Tables(Data), Seasonal variations, Statistical analysis, Atmospheric pressure, Atmospheric density, Sound transmission, Acoustic velocity.

The high altitude meteorological data reports (formerly meteorological rocket network firings) are issued monthly by World Data Center A for meteorology. Each report contains the wind and temperature measurements from all available high altitude meteorological sounding data for that particular month, along with computed values for pressure, density, and speed of sound. The local rawinsonde observation nearest the time of the high altitude meteorological sounding is also included when available. Statistical tables and graphs of current month means and standard deviations for all parameters with long-term means for the same month are presented immediately following the monthly observations. A brief monthly summary designed to compare the current month's means with the long-term means introduces this section of the publication.

COM-74-90018-02/GA MF$1.45
National Oceanic and Atmospheric Administration, Washington, D.C. Environmental Data Service.
MARINERS WEATHER LOG, VOLUME 18, NUMBER 2, MARCH 1974.
Bimonthly rept.,
Elwyn E. Wilson. Mar 74, 75p NOAA-74042903
Paper copy available from Environmental Data Service, 3300 Whitehaven St., N. W., Washington, D.C. 20235. Free.

Descriptors: *Marine meteorology, *Periodicals, Tropical cyclones, North Pacific Ocean, Tsunamis, Warning systems, Hurricanes, Tropical cyclones, Meteorological data, North Atlantic Ocean.
Identifiers: Sailboats, Recreational boating.

In addition to its regular sections, hints to observers, tips to the radio officer, Hurricane Alley, On the editors desk, marine weather review and marine weather diary this issue contains articles entitled: Dangers of Ocean Sailing as Encountered by PATTI I; Eastern North Pacific Tropical Cyclones, 1973; and The Tsunami Warning System.

COM-74-90018-02-01/GA
(Order as COM-74-90018-02)
Department of Labor, Washington, D.C.
DANGERS OF OCEAN SAILING AS ENCOUNTERED BY PATTI I,
Edward J. Bergin, and O. Jack Buchanek. Mar 74, 8p NOAA-74042903-1
Included in Mariners Weather Log, v18 n2 p71-77 Mar 74, COM-74-90018-02.

Descriptors: *Boats, *North Atlantic Ocean, *Meteorological data, Weather, Sea states, Storms, Wind(Meteorology), Safety.
Identifiers: Small craft, *Sailboats, *Recreational boating.

PATTI I, was a United States documented pleasure yacht of 11 tons gross. She was a U.S.-built stock Coronado 35 sailboat, with a 30-horsepower inboard gas auxilliary engine. A synopsis of the weather encountered during the voyage from Norfolk on November 3rd is presented. Although they lost PATTI I, all lives were saved. They found that the North Atlantic in late fall is no place for even a well-found small yacht. Weather information is too sparse for small craft. Pre-departure weather checks should be obtained from the nearest National Weather Service Marine Forecast Office, and climatological sources should be consulted during the planning stages. It is suggested that those contemplating open ocean sailing or boating should consult the many climatological sources cited in this article.

COM-74-90018-02-02/GA
(Order as COM-74-90018-02)
Eastern Pacific Hurricane Center, San Francisco, Calif.
EASTERN NORTH PACIFIC TROPICAL CYCLONES, 1973.
Mar 74, 10p NOAA-74042903-2
Prepared in cooperation with Central Pacific Hurricane Center, Honolulu, Hawaii.
Included in Mariners Weather Log, v18 n2 p78-86 Mar 74.

Descriptors: *Tropical cyclones, *North Pacific Ocean, Storms, Hurricanes, Meteorological data, Storm tracks, Meteorological satellites.
Identifiers: Hurricane Ava, Tropical storm Bernice, Tropical storm Claudia, Hurricane Doreen, Hurricane Emily, Hurricane Florence, Tropical storm Glenda, Tropical storm Heather, Hurricane Irah, Tropical storm Jennifer, Hurricane Katherine, Hurricane Lillian, ESSA-8 satellite, NOAA-2 satellite.

Tropical cyclone activity in the eastern North Pacific Ocean began June 1 and continued through October 9. It was one of the least active seasons since information from operational satellites, which completely cover the tropical areas, became available to field stations in 1966. A total of six tropical depressions, five tropical storms, and seven hurricanes required the issuance of 106 bulletins and 195 advisories. Storm activity for 1973 and earlier years is shown. The primary source of data in observing tropical cyclones during 1973 was from ESSA-8 and NOAA-2 satellites. A summary of eastern North Pacific tropical storms and hurricanes is included and storm tracks are shown. A series of daily satellite pictures are shown for five of the seven hurricanes (Ava, Doreen, Emily, Irah, and Katherine).

JPRS-62019 PC$3.25/MF$1.45
Joint Publications Research Services, Arlington, Va.
SELECTED TRANSLATIONS FROM BULLETIN OF THE SOVIET ANTARCTIC EXPEDITION,
I. G. Petrov, L. I. Dubrovin, A. I. Voskresenskii, and M. M. Schneider. 17 May 74, 30p
Trans. of Sovetskaya Antarkticheskaya Ekspeditsiya. Informatsionnyi Byulleten (USSR) n87 p5-13, 21-24, 29-34, 55-56 1973.

Descriptors: *Antarctic regions, *Atmospheric physics, *Meteorology, *Gravimetric geodesy, Translations, USSR.

Contents:
- Investigations conducted by the sixteenth Soviet Antarctic Expedition;
- Scientific stations in Antarctica (1972);
- Investigation of the Southern Hemisphere atmosphere by means of constant-level balloons;
- Tie-in of gravimetric points Mirnyy-Vostok.

PB-232 823/5GA PC$9.75/MF$1.45
Colorado State Univ., Fort Collins. Dept. of Atmospheric Science.
NUMERICAL SIMULATION OF AN ICE AGE PALEOCLIMATE.
Atmospheric Science paper,
Fred N. Alyea. Aug 72, 134p AS-Paper-193
Grant NSF-GA-11637

Descriptors: *Paleoclimatology, *Atmospheric circulation, Mathematical models, Atmosphere models, Equations of motion, Theses.

In order to simulate the climate of an ice age, a two-level, quasi-goestrophic, spectral general circulation model for the northern hemisphere is developed. Horizontal diffusion and vertical shearing stresses are incorporated along with a diabatic heating function, including the effects of radiation, horizontal and vertical heat transfer and condensation heating. Orographic influences as well as land-sea-ice distributions of heating are represented at the lower boundary. The model was integrated forward in time for sixty days under two separate experimental conditions; one representing a present day mean July climate which is used as a bench mark for comparison and the other aimed at simulation of a summer ice age climate with particular emphasis on the last great ice age maximum of the Quaternary period some 18,000 years ago. Forcing and surface boundary conditions for the Quaternary integration were established from a variety of paleogeologic sources. (Modified author abstract)

PB-232 987/8GA PC$3.75/MF$1.45
Hydrocomp, Inc., Palo Alto, Calif.
PREDICTION OF DEW POINT TEMPERATURE, SOLAR RADIATION AND WIND MOVEMENT DATA FOR SIMULATION AND OPERATIONS RESEARCH MODELS.
Completion rept.,
Delbert D. Franz. Apr 74, 57p W74-08933, OWRR-C-3266(3736)(1)
Contract DI-14-31-0001-3736

Descriptors: *Dew Point, *Solar radiation, *Wind velocity, *Weather forecasting, Correlation techniques, Statistical analysis, Tables(Data).

Predictive relationships for mean daily dew point temperature, daily total shortwave solar radiation, and daily wind movement using daily maximum and minimum air temperature as the predictor variable were derived for approximately 23 stations in the United States. A simple linear regression of dew point on minimum temperature proved to be best for the dew point prediction. The fit was best in the humid regions in the winter and poorest in the summer in the arid and semi-arid regions. Percent of possible solar radiation was regressed on the daily range in temperature for the solar radiation relationship. The fit obtained was poorer than the fit for dew point. The coefficient of correlation for the dew point relationships was most frequently in the range of 0.7 to 0.95 while for solar radiation the range was generally for 0.5 to 0.8. The standard error of estimate for dew point ranged from 2.0 to 10.0 degrees Fahrenheit with most values in a narrower range from 4.0 to 6.0 degrees. The standard error for solar radiation was most frequently in the range of 10 to 25%.

TT-71-51037 PC$3.00/MF$1.45
Forest Service, Washington, D.C.
METHODS OF OBSERVATION AND CERTAIN LAWS UNDERLYING TEMPERATURE CONDITIONS OF SNOW COVER (METHODY NABLYUDENII I NEKOTRE ZAKONOMERNOSTI TEMPERATURNOGO REZHIMA SNEZHNOGO POKROVA),
E. B. Krasnoselskii. 1973, 19p
Trans. of Sredneazyatskii Nauchno-Issledovatelskii Gidrometeorologicheskii Institut. Trudy (USSR) n27(42) p60-70 1966. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Snow cover, *Temperature gradients, Temperature measurement, Diurnal variations, Translations, USSR.

The article discusses one method of temperature observation in snow. Presented are the results of the author's observations on the nature of temperature wave penetration into a snow mass. A semi-empirical dependence of amplitude of each day's course of temperature on the overlying snow mass is suggested.

TT-73-50031 PC$4.50/MF$1.45
National Oceanic and Atmospheric Administration, Rockville, Md.
CLOUD PHYSICS AND WEATHER MODIFICATION (PROBLEMY FIZIKI OBLAKOV I AKTIVNYKH VOZDEISTVII),
Yu. S. Sedunov. 1974, 112p
Trans. from Institut Eksperimentalnoi Meteorologii. Trudy (USSR) n19 1970, by H. Olaru. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Weather modification, *Cloud physics, USSR, Artificial precipitation, Precipitation(Meteorology), Seasonal variations, Cooling, Adiabatic flow, Condensation nuclei, Coagulation, Diffusion, Particles, Drops(Liquids), United States, Translations, Reviews.

Contents:
- Cloud physics and weather modification research in the U.S.A.;
- Modification of clouds and precipitation in central European USSR;
- Measurement of condensation nuclei and cloud nuclei concentrations;
- Hydrodynamic aspects of aerosol particle coagulation theory;
- Use of intermittent illumination in aerosol research.

5. BEHAVIORAL AND SOCIAL SCIENCES

5A. Administration and Management

AD-779 997/6GA PC$4.50/MF$1.45
Army War Coll Carlisle Barracks Pa
THE ACHIEVEMENT OF ORGANIZATIONAL OBJECTIVES BY TASK FORCE.
Student essay,
Edgar F. Todd. 15 Sep 73, 26p

Descriptors: *Management, *Organizations.
Identifiers: *Task force concept, Management methods.

In many instances specific, unexpected problems or tasks arise in management which can be more effectively solved or accomplished by not attempting to utilize the formal organizational structure and established lines of coordination. If those problems or tasks are considered as specific missions or objectives, a properly formed task force may very well be the ideal instrument for the accomplishment of those objectives. The task force is formed to accomplish a defined objective and is dissolved when that objective has been attained. (Author)

AD-780 520/3GA PC$3.75/MF$1.45
Electronic Systems Div L G Hanscom Field Mass
AUTOMATED FINANCIAL ANALYSIS FOR GOVERNMENT PROGRAM OFFICES,
Henry H. Seward, and Gregory E. Maust. Jun 74, 62p Rept no. ESD-TR-74-58

Descriptors: *Finance, *Management, *Department of Defense, Scheduling, Contracts, Costs, Computer programming, Air Force.
Identifiers: *Financial management, Cost estimated Planning programming budgeting.

The report describes an organization which contracts for both research and development activity and subsequent acquisition contracts. After this description, the paper suggests a practical method for improving the flow of financial and schedule information from the private contractor to the government office. Finally, it describes a computer analysis program which is currently being used to verify and analyze contractor schedule and financial information and to prepare projected price at completion estimates. (Author)

5B. Documentation and Information Technology

AD-780 061/8GA PC$4.50/MF$1.45
Advisory Group for Aerospace Research and Development Paris (France)
HOW TO OBTAIN INFORMATION IN DIFFERENT FIELDS OF SCIENCE AND TECHNOLOGY: A USER'S GUIDE.
Lecture series.
1974, 124p* Rept no. AGARD-LS-69
NATO furnished.

Descriptors: *Information centers, Information processing, Information, Flow, Global, Distribution.
Identifiers: Information dissemination, Lectures.

The purpose of the series is to outline for the user of information systems the principles upon which such systems are based, and thus enable him to understand and more readily exploit their potentialities. The series includes presentations of general information on this subject and more detailed examples of specific scientific, medical and governmental systems.

AD-780 224/2GA PC$3.25/MF$1.45
Office of Naval Research London (England)
EUROPEAN SCIENTIFIC NOTES. VOLUME 28, NUMBER 5.
Conference rept.,
Bruce J. McDonald, and Victoria S. Hewitson. 31 May 74, 40p Rept no. ESN-28-5
See also report dated 30 Apr 74, AD-779 270.

Descriptors: *Scientific research, *Europe, Periodicals, Reviews, Medicine, Biology, Chemistry, Space exploration, Engineering, Psychology, Physics, Naval research, Oceanography.

The monthly publication presents brief articles concerning recent developments in European scientific research. Topics are discussed on areas of: Behavioral sciences, education, engineering, material sciences, mathematical sciences, medicine, ocean science, and, physical sciences.

AERE-R-7673 PC$4.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
ON-LINE SEARCHING OF COUNCIL OF EUROPE CONVENTIONS AND AGREEMENTS: A STUDY IN BILINGUAL DOCUMENT RETRIEVAL.
N. H. Price, C. Bye, and B. Niblett. Jan 74, 15p

Descriptors: Atomic energy laws, Computers, Data display devices, Energy policy, Europe, Ibm computers, Information retrieval, International agreements, United kingdom.

For abstract, see NSA 29 12, number 31594.

JPRS-62804 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
ACHIEVEMENTS OF THE GEORGIAN SSR ACADEMY OF SCIENCES,
I. N. Vekua. 15 May 74, 16p
Trans. of Akademiya Nauk Gruzinskoi SSR, Tiflis. Soobshcheniya, n1 p241-252 Jan 73.

Descriptors: *Meetings, USSR, Translations, Proceedings.

The report contains an address by I. N. Vekua president of the Georgian SSR Academy of Sciences before the general meeting of the academy.

PB-232 456/4GA PC$5.75/MF$1.45
Long Island Univ., Boulder, Colo. USAC project.
LONG ISLAND UNIVERSITY, USAC PROJECT. PRIVACY, SECURITY, COMPUTERS AND THE CITY: GUIDELINES FOR MUNICIPAL INFORMATION SYSTEMS.
Special technical rept.,
O. E. Dial, and Edward M. Goldberg. Feb 74, 218p* USAC-LIU3-0001
Contract HUD-H-2069R

Descriptors: *Information systems, *Local government, *Urban planning, Municipalities, Computer programming, Auditing, Data processing, Standards.
Identifiers: USAC project, *Management information systems, *Computer information security, *Computer privacy, *Housing and urban development research.

The report is from a USAC series covering activities from systems analysis through implementation and evaluation of urban information systems. The report explains why a city should be concerned with problems of privacy and security in the operation of its information system, whether in a manual or manual/computer mode. It then explains how to deal with the problems in a step-by-step presentation of topics, each of which is supported by discussion, a model, and examples, from the preparation of a Data Access Control Plan to the implementation of each of its parts. Tables of Federal and state legislation now being considered, and a classified, annotated bibliography, are also contained in the report.

PB-232 630/4GA PC$3.00/MF$1.45
Library of Congress, Washington, D.C. Science and Technology Div.
DIRECTORIES CONTAINING DESCRIPTIVE INFORMATION ON NONBIBLIOGRAPHIC DATA BASES. A SELECTED BIBLIOGRAPHY.
Dec 73, 22p* ISBN-O-8444-0120-X

Descriptors: *Bibliographies, *Directories, Data storage, Information centers.

The bibliography was produced by the Library of Congress(LC) at the request of the National Science Foundation. To be included in the bibliography, a directory had to describe ten or more data bases. These data bases had to be nonbibliographic. Directories could be no older than 1968, unless their coverage was considered sufficiently unusual to warrant exception. Data bases could cover any subject, could be located in any country, and could be described in any language. The final selection was culled from a broad corpus of candidates, including some 1,500 directories retrieved in a computer search of LC's Machine-Readable Cataloging (MARC) data base from 1968 to the present.

PB-232 657/7GA PC$6.75/MF$1.45
British Library Lending Div., Boston Spa (England).
LIST OF BOOKS RECEIVED FROM THE USSR AND TRANSLATED BOOKS.
May 74, 74p LBRU-189

Descriptors: *Books, *USSR, *Indexes(Documentation), Sociology, Mathematics, Physics, Engineering, Chemistry, Medicine, Electronics, Agriculture, Industries, Transportation, Textiles.

The list of books from the U.S.S.R. is arranged in broad subject groups, approximately in U.D.C. order, sub-divided by authors in the order of the Cyrillic alphabet. Translated Russian books are included as a separate section following the main part of the list, also in subject groups; sub-divided by authors in the order of the Roman alphabet.

PB-232 658/5GA PC$8.75/MF$1.45
British Library Lending Div., Boston Spa (England).
BLL ANNOUNCEMENT BULLETIN. A GUIDE TO BRITISH REPORTS, TRANSLATIONS AND THESES.
May 74, 111p BAB-74-5

Descriptors: *Technical reports, *Great Britain, *Indexes(Documentation), Research, Translations, Theses, Government, Industries, Universities, Great Britain.
Identifiers: Announcement bulletins.

The bulletin lists British report literature and translations produced by British government organizations, industry, universities and learned institutions, as well as some doctoral theses accepted at British universities during and after 1970.

PB-232 659/3GA PC$5.00/MF$1.45
British Library Lending Div., Boston Spa (England).
INDEX OF CONFERENCE PROCEEDINGS RECEIVED BY THE BLL. CONFERENCE NUMBERS 74-02124-74-02619.
May 74, 36p ICP-80

Descriptors: *Meetings, *Indexes(Documentation), Proceedings, Agriculture, Biology, Chemistry, Medicine, Psychology, Engineering, Physics, Environment, Transportation, Management, Great Britain.

The collection of recent conference proceedings covers the fields of the natural sciences, the technologies the social sciences and the humanities. All types of conference proceedings are covered, including those which appear in serial form, those reporting individual conferences and published as books and those published as parts of normal serials. The list is in two parts. The first part lists the details of the conference indexed as follows: Title of conference proceedings, Place and date of conference, Filing position at the BLL, Conference number. The second part is a list of subject keywords taken from the titles of the conference proceedings.

PB-232 768/2GA PC$7.50/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
AUSTRALIAN SCIENCE INDEX, VOLUME 18, NUMBER 1, 1974.
1974, 88p
See also PB-231 075. Index to Articles Published in Australian Scientific and Technical Serials.

Descriptors: *Indexes(Documentation), *Research, *Australia, Periodicals, Sociology, Mathematics, Physics, Geology, Oceanography, Geography, Chemistry, Engineering, Biology, Agriculture.

Australian Science Index is intended to provide an up-to-date subject and author guide to Australian scientific research issued in serial form by scientific and technical associations and societies, research institutions, government and other organizations. The Index is published monthly. Titles are arranged in broadly classified sections and specific topics are listed in the subject index.

PB-232 769/0GA PC$6.25/MF$1.45
Commonwealth Scientific and Industrial Research Organization, Melbourne (Australia).
AUSTRALIAN SCIENCE INDEX. VOLUME 18, NUMBER 2, 1974.
Feb 74, 61p
Index of Articles Published in Australian Scientific and Technical Serials.

Descriptors: *Indexes(Documentation), *Research, *Australia, Periodicals, Sociology, Mathematics, Physics, Astronomy, Oceanography, Geography, Chemiistry, Engineering, Biology, Agriculture.

The Index is intended to provide an up-to-date subject and author guide to Australian scientific research issued in serial form by scientific and technical associations, research institutions, government and other organizations. The index is published monthly. Titles are arranged in broadly classified sections and there is an author and subject index.

TID-4845 PC$13.60/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
INDEX TO CONFERENCES ASSIGNED CONF- NUMBERS BY THE TECHNICAL INFORMATION CENTER, U.S ATOMIC ENERGY COMMISSION.
N. E. Hardin, and D. H. McGinnis. Jan 74, 589p

Descriptors: Indexes, Information retrieval, Proceedings.

For abstract, see NSA 29 12, number 31543.

5C. Economics

AD-779 870/5GA PC$3.00/MF$1.45
California Univ Berkeley Operations Research Center
ECONOMIC THEORETICAL STRUCTURE OF COST-BENEFIT ANALYSIS.
Research rept.,
Ronald W. Shephard. May 74, 19p Rept no. ORC-74-13
Contract N00014-69-A-0200-1010

Descriptors: *Economics, *Costs, Production, Economic models.
Identifiers: *Production functions, Utility functions, *Benefit cost analysis.

For a general model of production structure, various Indirect Production Functions are defined and used to construct cost-return (benefit) relationships. When an ordinal utility function is used for valuation of output vectors, a cardinalization of the values of this function is suggested in terms of the minimal cost of getting output vectors at least as preferred as those of the indifference class to which is associated an ordinal value of V(u). (Author)

AD-779 871/3GA PC$3.00/MF$1.45
California Univ Berkeley Operations Research Center
A SHORT PROOF OF CASS' THEOREM ON CAPITAL OVERACCUMULATION.
Research rept.,
Lawrence Benveniste, and David Gale. Apr 74, 15p Rept no. ORC-74-12
Contract N00014-69-A-0200-1010, Grant NSF-GP-30961

Descriptors: *Economics, Mathematical models, Consumption, Accumulation, Theorems.
Identifiers: *Cass theorem, *Capital overaccumulation, Production functions, Prices.

The theorem of the title asserts that under suitable assumptions a program of capital accumulation is inefficient if and only if the corresponding price sequence (p sub t) satisfies the summation from t=0 to infinity of (1/p sub t) < infinity. The authors present a short proof of this fact generalized to the case where the production function may vary from one period to the next. (Author)

AD-779 914/1GA PC-GPO/MF$1.45-NTIS
American Univ Washington D C Foreign Area Studies

AREA HANDBOOK FOR BOLIVIA,
Thomas E. Weil, Jan Knippers Black, Howard I. Blutstein, Hans J. Hoyer, and Kathryn T. Johnston. 1974, 418p DA-PAM-550-66
Supersedes AD-430 728.
Availability: Paper copy available from GPO $6.15 as D101.22:550.58.

Descriptors: *Bolivia, *Handbooks, Economics, Sociology, Political science, Commerce, Transportation, Military forces(Foreign).
Identifiers: Area studies.

The volume is one of a series of handbooks prepared by Foreign Area Studies (FAS) of The American University, designed to be useful to military and other personnel who need a convenient compilation of basic facts about the social, economic, political, and military institutions and practices of various countries. The emphasis is on objective description of the nation's present society and the kinds of possible or probable changes that might be expected in the future.

AD-780 119/4GA PC$5.00/MF$1.45
Stanford Research Inst Menlo Park Calif Strategic Studies Center
COMMUNIST CHINA'S TRADE PATTERNS AND ECONOMIC CAPABILITY.
Technical note,
Yuan-Li Wu. Jul 73, 156p Rept no. SSC-TN-8974-92
Contract DAHC19-71-C-0001

Descriptors: *China, *Political science, *Commerce, Economics, Foreign policy, National defense, Procurement, Weapon systems.
Identifiers: International trade.

The paper contains an analysis of the foreign trade patterns and economic policies of the People's Republic of China. Insights into both foreign policy and defense policy objectives are sought by examining the content, quantity, and direction of PRC foreign trade. PRC political choices with respect to the nature of trading partners as well as defense choices with respect to the most efficient means of obtaining the necessary materials for defense requirements are investigated with a view toward establishing their interrelationships. (Author)

AD-780 281/2GA PC$4.25/MF$1.45
Edaw Inc San Francisco Calif
LAND PRODUCTIVITY DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 21p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 282.

Descriptors: *Land areas, *Economics, *Texas, Global communication systems, Extremely low frequency, Sites, Production, Inventory, Agriculture, Farm crops, Minerals, Livestock, Forestry, Wood, Tables(Data).
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specified area studied is approximately 2400 square miles in area and is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 287/9GA PC$4.50/MF$1.45
Edaw Inc San Francisco Calif
LAND PRODUCTIVITY DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 26p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 288.

Descriptors: *Land areas, *Economics, *Michigan, Global communication systems, Extremely low frequency, Sites, Production, Inventory, Agriculture, Farm crops, Minerals, Livestock, Forestry, Wood, Tables(Data).
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

COM-73-50835-18/GA PC-GPO/MF$1.45-NTIS
Department of Commerce, Washington, D.C.
COMMERCE TODAY. VOLUME IV, NUMBER 18.
10 Jun 74, 43p
Paper copy available from GPO $29.80/year as C1.58:4, $1.15/copy as C1.58:4/18.

Descriptors: *Commerce, Reviews, Inflation(Economics), Marine transportation, Iron, Steel, Metal industry, Air conditioning equipment, Energy conservation, Research.

Contents: Wholesale price index indicates likely course of inflation in future; UN liner conference could have major world maritime impact; Ferrous shortages continue to plague major industries; Air conditioner labels show how to keep coolest for least dollars; Energy management digest; Domestic business report; International commerce report.

COM-73-50835-19/GA PC-GPO/MF$1.45-NTIS
Department of Commerce, Washington, D.C.
COMMERCE TODAY. VOLUME IV, NUMBER 19.
24 Jun 74, 44p
Paper copy available from GPO $29.80/year as C1.58:4, $1.15/copy as C1.58:4/19.

Descriptors: *Commerce, Labor, Costs, Fuel oil, Imports for consumption, Energy conservation, Research.

Contents: Recent decline in productivity and associated increase in unit labor costs are unfavorable but degree of concern is 'probably exaggerated' says Commerce's top economist; Inflow of 'petrodollars' in near East brings trade opportunities for U.S. suppliers; Building boom in coastal areas increases potential hurricane toll; Energy management digest; Domestic business report; International commerce report.

COM-74-11030/5GA PC$6.00/MF$1.45
Texas A and M Univ., College Station.
A SURVEY OF THE ECONOMIC AND ENVIRONMENTAL ASPECTS OF AN ONSHORE DEEPWATER PORT AT GALVESTON, TEXAS. PART I. POTENTIAL ECONOMIC EFFECTS,
Daniel M. Bragg. Apr 74, 58p TAMU-SG-74-213 NOAA-74050701
Grant NOAA-043-158-18
Report on Sea Grant Program. See also Part 2, COM-74-11031.

Descriptors: *Seaports, *Economic impact, *Fuel oil, *Marine transportation, Surveys, Petroleum industry, Petroleum refining, Employment, Environmental surveys, Texas.
Identifiers: Galveston(Texas), *Onshore deepwater ports, Offshore terminals, *Deepwater terminals.

In summarizing the study, the author indicates that it cannot be shown absolutely that an offshore terminal would have a cost advantage over a terminal located onshore. For this reason, cost in itself cannot be the sole determining factor in deciding the feasibility of the onshore deepwater terminal at Galveston. The economic impact of an onshore deepwater terminal at Galveston will be somewhat greater, throughout the region, than will the impact from an offshore oil terminal. In addition to the impact which could result from growth in oil refining, and supporting industry, the onshore port will have an impact of additional jobs and expenditures resulting from the operation of the port. Such things as tug hire, stevedoring, line handling and similar, port-related activities, will be of a greater magnitude than they would be at an offshore terminal.

COM-74-50061/GA PC$0.25/copy
Bureau of International Commerce, Washington, D.C.
FOREIGN ECONOMIC TRENDS AND THEIR IMPLICATIONS FOR THE UNITED STATES.
1974,147 issues
Paper copy available from GPO $37.50/year as C42.30.

The series of reports presents current business and economic developments in every country that offers a present or potential market for United States goods. The reports include a summary of the prospective impact on the United States economy, changing trade patterns, prospective business trends, balance of payments, government policies, and investments. For individual country reports, order by COM-number listed below:

ET-74-037. Brazil. Semiannual rept. May 74, 8p, supersedes ET-73-114 **COM-74-50061-037/GA**
ET-74-038. Kuwait. Annual rept. May 74, 20p, supersedes ET-73-020 **COM-74-50061-038/GA**
ET-74-040. Bangladesh. Annual rept. May 74, 8p **COM-74-50061-040/GA**
ET-74-043. Democratic Republic of Germany. Annual rept. May 74, 7p **COM-74-50061-043/GA**
ET-74-048. United Kingdom. Semiannual rept. May 74, 15p, supersedes ET-73-086 **COM-74-50061-048/GA**
ET-74-049. India. Semiannual rept. May 74, 11p, supersedes ET-73-133 **COM-74-50061-049/GA**
ET-74-050. Trinidad and Tobago. Annual rept. May 74, 11p, supersedes ET-73-061 **COM-74-50061-050/GA**
ET-74-051. Mexico. Semiannual rept. May 74, 7p, supersedes ET-73-127 **COM-74-50061-051/GA**
ET-74-054. Korea. Semiannual rept. Jun 74, 15p, supersedes ET-73-123 **COM-74-50061-054/GA**

COM-74-50113/GA PC-GPO/MF$1.45-NTIS/copy
Domestic and International Business Administration, Washington, D.C.
OVERSEAS BUSINESS REPORTS.
John L. Priamou. 1974,approx. 99 issues
Paper copy available from GPO $28.50/year as C1.50:74, $0.30/copy.

The reports present basic authoritative information for exporters, importers, investors, manufacturers, researchers, and those concerned with international trade and economic conditions. For individual reports, see below:

OBR-74-11. Marketing in Greece. Jun 74, 28p **COM-74-50113-11/GA**
OBR-74-14. Summary of the Bulgarian Five-Year Plan (6th), 1971-1975. Jun 74, 8p **COM-74-50113-14/GA**
OBR-74-16. World Trade Outlook for Africa. Jun 74, 12p **COM-74-50113-16/GA**
OBR-74-17. World Trade Outlook for the Near East and South Asia. Jun 74, 11p **COM-74-50113-17/GA**
OBR-74-18. World Trade Outlook for the Far East. Jun 74, 12p **COM-74-50113-18/GA**

OBR-74-19. World Trade Outlook for Western Europe and Canada. Jun 74, 20p COM-74-50113-19/GA
OBR-74-20. World Trade Outlook for Latin America. Jun 74, 11p COM-74-50113-20/GA

COM-74-50189-03-06/GA
(Order as COM-74-50189-03)
National Marine Fisheries Service, Washington, D.C. Market Research and Services Div.
FISH MEAL: INTERNATIONAL MARKET SITUATION AND THE FUTURE,
Jukka Kolhonen. Mar 74, 6p MFR-Paper-1044
NOAA-74041711-6
Included in Marine Fisheries Review, v36 n3 p36-40 Mar 74, COM-74-50189-03.

Descriptors: *Fish meal, *Market research, Prices, Feeding stuffs, Proteins, Production, Supply(Economics), Demand(Economics).

Rapid growth of world production of fish meal was interrupted by a marked decrease in 1972. Major cause was the Peruvian anchovy crisis, but fish meal production of other countries has also declined. The demand for fish meal is influenced by: (1) The development of sophisticated commercial feed mixing industry; (2) the size of the markets for poultry and meat; and (3) the availability of other protein feeds. All these three areas have been growing. Fish meal prices increase substantially after 1972, but now there has been a slight decline because the world supplies of soybean protein are expected to improve.

COM-74-70035/2GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1971. FUELS AND ELECTRIC ENERGY USED, BY MAJOR INDUSTRY GROUPS.
Jul 73, 14p M71(AS)-4
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25. Entire series (all 1971 reports) $7.75.

Descriptors: *Manufacturers census, *Industries, *Operating costs, Fuel consumption, Electric utilities, Tables(Data).

The report presents estimates of the total cost of fuels, quantity and cost of electric energy purchased for use, and quantity of electric energy generated and used in manufacturing plants. The figures do not include data for fuels produced and consumed in the same plant and the cost of fuels used as raw materials. Data are shown for the United States by major industry groups and industry, 1971 and 1970.

COM-74-70036/0GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1971. BOOK VALUE OF FIXED ASSETS AND RENTAL PAYMENTS FOR BUILDINGS AND EQUIPMENT.
Aug 73, 25p M71(AS)-7
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25/copy. Entire Series (all 1971 reports) $7.75.

Descriptors: *Manufacturers census, *Rental equipment, *Buildings, *Payment, Industries, Fixed assets, Book value, Depreciation, Operating costs, Tables(Data).

The report provides data on the gross book value of depreciable assets, the value of shipments, and rental payments for structures and machinery and equipment, for operating manufacturing establishments in the United States during 1971 and 1970. Data are shown by industry groups and industries and by geographic areas.

COM-74-70038/6GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1971. EMPLOYMENT AND LABOR COSTS FOR OPERATING MANUFACTURING ESTABLISHMENTS.
Jun 73, 17p M71(AS)-8
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25/copy. Entire series (all 1971 reports) $7.75.

Descriptors: *Manufacturers census, *Employment, *Operating costs, *Census, Industries, Expenses, Salaries, Tables(Data).

The report provides data on the employment and labor costs (payroll, Social Security and other employer payments) for operating manufacturing establishments in the United States, based on the 1971 Annual Survey of Manufactures. Data for 1971 and 1970 are shown by industry groups and industries and for divisions and States. The report is a preprint of a chapter in the Annual Survey of Manufactures: 1971 volume.

COM-74-70039/4GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1971. INDUSTRY PROFILES.
Sep 73, 272p M71(AS)-10
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $3.00. Entire series (all 1971 reports) $7.75.

Descriptors: *Manufacturers census, *Industries, *Employment, *Census, Salaries, Value, Shipments, Expenses, Operating costs, Tables(Data).

The report provides data for 527 manufacturing industry groups and industries. Statistics are given for the country as a whole. Data were obtained from the Annual Survey of Manufactures for 1958, 1963, and 1967. For each individual industry and industry group covered, twenty basic data series are shown for the years 1958 through 1971. These series relate to: employment, payrolls, man-hours, value of industry shipments, value added by manufacture, capital expenditures, inventories, and selected averages. Industry data shown refer to the two-, three-, and four-digit industries as defined in the Office of Management and Budget's Standard Industrial Classification Manual (SIC) of 1967. For the years 1958, 1963, and 1967, industry statistics were developed from a complete census of all manufacturing establishments. Data for all other years are estimates based on reports from the ASM sample consisting of approximately 65,000 establishments.

COM-74-70040/2GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1970. GENERAL STATISTICS FOR INDUSTRY GROUPS AND INDUSTRIES.
Feb 72, 31p M70(AS)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25/copy. Entire series (all 1970 reports) $4.50.

Descriptors: *Manufacturers census, *Industries, *Economics, *Census, Employment, Salaries, Expenses, Shipments, Operating costs, Tables(Data).

The report presents general manufacturing statistics for industry groups and industries from the 1970 Annual Survey of Manufactures. The tables provide data on employment, man-hours, payrolls, value added by manufacture, cost of materials, value of industry shipments, capital expenditure, and end-of-year inventories for all industries and industry groups. Comparative data from the 1969 Annual Survey of Manufactures are also included, as well as a table presenting a regrouping of the industry statistics into aggregates which are market oriented.

COM-74-70041/0GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1970. VALUE OF PRODUCT SHIPMENTS.
Mar 72, 44p M70(AS)-2
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25/copy. Entire series (all 1970 reports) $4.50.

Descriptors: *Manufacturers census, *Manufacturers shipments, Value, Estimates, Tables(Data).

The report contains estimates of the value of product shipments during 1970 for approximately 1,100 classes of manufactured products for which information was obtained in the 1970 Annual Survey of Manufactures. Data are presented for the value of shipments, by class of products for 1970, with comparative figures from the 1969 Annual Survey of Manufactures and the 1967 Census of Manufactures. Standard errors of the 1969 estimates are also included. Figures on the quantity and value of selected product classes are shown for 1969 and 1968, by class of products and unit of measure.

COM-74-70042/8GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1970. VALUE OF MANUFACTURERS' INVENTORIES.
Mar 72, 18p M70(AS)-3
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25/copy. Entire series (all 1970 reports) $4.50.

Descriptors: *Manufacturers census, *Industries, *Inventories, Economic surveys, Manufacturing, Tables(Data).

The report presents data on the value of manufacturers' inventories for industry groups and industries from the 1970 Annual Survey of Manufactures. 1970 data on the total end-of-year inventories of manufacturing establishments and distribution of inventory data are shown by: finished products; work in process; and materials, supplies, and fuels, etc., with comparable data from the 1969 Annual Survey of Manufactures. Estimates of the standard errors computed from the data in the report are also included. Inventory figures are presented by important four digit manufacturing industries, for most three digit industry subgroups, and for all two digit industry groups.

COM-74-70043/GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1970. STATISTICS FOR DIVISIONS AND STATES.
1972,10 reports
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $4.50 entire series (all 1970 reports).

These reports present final data, for 1970, on employment, payrolls, man-hours, cost of materials, value of industry shipments, value added by manufacture, end-of-year inventories, and new capital expenditures. Each division report also contains a summary table by industry and industry groups, and tables for each State within the division showing statistics for the State by industry and industry groups. For individual reports, see below:

M70(AS)-6.1 New England Division. Aug 72, 21p, PC-CENSUS $0.25
M70(AS)-6.8 Mountain Division. Aug 72, 15p, PC-CENSUS $0.25
M70(AS)-6.9 Pacific Division. 1972, 22p, PC-CENSUS $0.50

COM-74-70046/9GA PC-CENSUS
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1970. EMPLOYMENT AND LABOR COSTS FOR OPERATING MANUFACTURING ESTABLISHMENTS.
Jun 72, 18p M70(AS)-8

Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.25/copy. Entire series (all 1970 reports) $4.50.

Descriptors: *Manufacturers census, *Employment, *Operating costs, *Census, Industries, Expenses, Salaries, Insurance, Workmens compensation, Tables(Data).

The report provides data on employment and labor costs for operating manufacturing establishments, by industry groups and industries, for the United States, 1970 and 1969. The labor costs shown include both pay-rolls and supplementary costs such as social security payments, workmen's compensation, and private insurance plans.

COM-74-70047/7GA PC-CENSUS
Bureau of the Census, Washington, D.C.
MANUFACTURERS' SHIPMENTS, INVENTORIES, AND ORDERS: 1967-1973.
Jul 73, 89p M3-1.5
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $1.25.

Descriptors: *Manufacturers census, *Industries, Manufacturers shipments, Manufacturers inventories, Manufacturers orders, Tables(Data), Unfilled orders.

The tables in this publication represent a revision of the data published monthly in the Current Industrial Reports Series M3-1, Manufacturers' Shipments, Inventories, and Orders. The revisions to the data result primarily from benchmarking the annual totals derived from the monthly survey to the annual survey of manufactures (ASM) totals for each year 1970 and 1971 and carrying forward the revised levels to March 1973. A small number of other corrections have also been introduced into the data. The current revisions do not reflect any changes in sample design or technique since last year's report. Summary data are shown for manufacturers' shipments and new orders (monthly average), unfilled orders, and inventories (end of year), without seasonal adjustment, 1967 to 1972.

COM-74-70048/5GA PC-CENSUS
Bureau of the Census, Washington, D.C.
MANUFACTURERS' SHIPMENTS, INVENTORIES, AND ORDERS: 1966-1972. REVISED.
Sep 72, 87p M3-1.4-Rev
Paper copy available from Bureau of the Census, Washington, D.C. 20233 $0.70.

Descriptors: *Manufacturers census, *Industries, Manufacturers shipments, Manufacturers inventories, Manufacturers orders, Tables(Data).

The tables in the report represent a revision of the data published monthly in the Current Industrial Reports Series M3-1, Manufacturers' Shipments, Inventories, and Orders. The revisions to the data result primarily from benchmarking the annuals derived from the monthly survey to the annual survey of manufactures (ASM) totals for each year 1966 to 1970 and carrying forward the revised levels to March 1970. However, the 1970 data for shipbuildings and railroad equipment was not benchmarked. A small number of other corrections have also been introduced into the data. The current revisions do not reflect changes in sample design, but a new smoothing technique for the adjustments of shipments data to annual survey of manufactures benchmark levels. Along with benchmarking of the data to annual totals, new seasonal factors have been developed for each series. The publication brings up to date the historical information published in M3-1, Manufacturers' Shipments, Inventories, and Orders: 1947-1963 revised and subsequent benchmark publications.

COM-74-70049/3GA PC-GPO
Bureau of the Census, Washington, D.C.
CENSUS OF MANUFACTURES: 1972. FUELS AND ELECTRIC ENERGY CONSUMED.
Special report series.
Jul 73, 100p MC72(SR)-6
Paper copy available from GPO $1.25 as C56.244/3:972/6.

Descriptors: *Manufacturers census, *Fuel consumption, *Industries, Volume, Operating costs, Heat, Electric power, Standard metropolitan statistical areas, Tables(Data).

The report is the first in a series of reports from the 1972 Census of Manufactures. Although this report is part of the overall 1972 Census of Manufactures, the information was collected for the year 1971 from the Annual Survey of Manufactures. Tables in the report provide information of the quantities and costs of specified fuels used for heat and power, quantity and cost of electric energy purchased, and quantity of electric energy generated less quantity sold by manufacturing plants in the United States. Data are shown for 1971 and earlier years and for selected years between 1954 and 1971, arranged by industry group and industry, State, and standard metropolitan statistical areas. An appendix provides a list of the standard metropolitan statistical areas.

COM-74-70050/1GA PC-GPO
Bureau of the Census, Washington, D.C.
ANNUAL SURVEY OF MANUFACTURES: 1970-1971.
Sep 73, 495p
Paper copy available from GPO $6.60 as C56.221/2:970-71.

Descriptors: *Manufacturers census, *Industries, *Census, Tables(Data), Shipments, Value, Employment, Leasing, Equipment, Cost estimates, Assets, Economic surveys, Standard metropolitan statistical areas, Counties.

The volume comprises data previously published in individual reports resulting from the 1970 and 1971 Annual Survey of Manufactures. Comparative data from the 1967 Census of Manufactures are included in many of the tables. Included in the report are: Summary data for all operating establishments, 1971-1849, and for divisions, States, and selected standard metropolitan statistical areas (SMSA's), 1971-1958; general statistics for industry groups and industries; general statistics for divisions, States, and SMSA's; value of shipments of products classes; quantity and value of shipments of selected product classes; gross book value of depreciable assets and value of shipments, operating manufacturing establishments, by industry groups and industries and by geographic areas for 1970 and 1971.

COM-74-70051/9GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. INORGANIC FERTILIZER MATERIALS AND RELATED ACIDS. JANUARY 1973.
Monthly rept.
Mar 73, 8p M28B(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year $0.15/copy.

Descriptors: *Industry surveys, *Industry productivity, *Inorganic fertilizer materials, *Industry shipments, Tables(Data), Nitric acid, Sulfuric acid, Ammonia, Phosphoric acid, Consumption.
Identifiers: *Current Industrial Reports.

Statistics are presented on: Quantity of production and stock of nitrogen fertilizer materials, phosphoric acid, and sulfuric acid, by type; and quantity of production, shipments, consumption, and stocks of super-phosphate and other phosphatic fertilizer materials, by type, for the current and preceding month, with comparative data for the current month a year ago. Included is a summary showing quantity of production of principal inorganic fertilizer materials for the current and each of 24 preceding months.

COM-74-70052/7GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. INORGANIC CHEMICALS. JANUARY 1973.
Apr 73, 5p M28A(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year, $0.15/copy.

Descriptors: *Industry surveys, *Industry production, *Inorganic chemicals, Tables(Data), Stock inventories, Chlorine, Sodium carbonates, Sodium hydroxide, Titanium dioxide, Hydrochloric acid, Aluminum sulfates, Sodium phosphates, Phosphorus.
Identifiers: *Current Industrial Reports.

Data are given on primary production and stocks on hand of specified inorganic chemicals, for the current and preceding month, with comparative figures for the current month a year ago. A summary is included, showing quantity of production of principal inorganic chemicals and gases, by type, for the current month and each of 24 preceding months.

COM-74-70053/5GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. IRON AND STEEL CASTINGS. JANUARY 1973.
Monthly rept.
Mar 73, 5p M33A(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year, $0.15/copy.

Descriptors: *Industry surveys, *Industry shipments, *Iron castings, *Steel castings, Tables(Data), Orders(Commitments), Iron and steel industry.
Identifiers: *Current Industrial Reports.

The report presents data on shipments for sale and for own use, and end-of-month unfilled orders for sale, by type of casting, for the current and preceding month, with comparative figures for the current month a year ago. A summary is included, showing quantity of shipments, by type, for the current month and each of 24 preceding months. Data also include a breakout of Ductile (nodular) iron by type of casting and for white iron castings.

COM-74-70054/3GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. NONFERROUS CASTINGS. JANUARY 1973.
Monthly rept.
Mar 73, 5p M33E(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year, $0.15/copy.

Descriptors: *Industry surveys, *Industry shipments, *Nonferrous castings, Tables(Data), Orders(Commitments). Metal industry.
Identifiers: *Current Industrial Reports.

The report shows quantity of shipments for sale and for own use, and unfilled orders for sale, by type of casting, for the current and preceding month, with comparative data for the current month a year ago. Also included is a summary showing shipments and unfilled commercial orders, for the current month and each of 24 preceding months.

COM-74-70055/0GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. INVENTORIES OF BRASS AND COPPER WIRE MILL SHAPES. JANUARY 1973.
Monthly rept.
Apr 73, 5p M33K(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year, $0.15/copy.

Descriptors: *Industry surveys, *Industry shipments, *Brass mill products, *Mill shapes, *Copper wire, Tables(Data), Inventories, Metal industry.
Identifiers: *Current Industrial Reports.

The monthly reports provide data for the current and preceding month on: Receipts, consumption, and end-of-month inventories of consumers (manufacturers only) of brass and copper wire mill products, by major industry group and shape; and shipments and end-of-month inventories of brass and wire mills of primary producers, by type of mill. A summary showing month-end inventories and other selected items for the current month and each of 24 preceding months is included.

COM-74-70056/8GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. METAL CANS. JANUARY 1973.
Monthly rept.
Apr 73, 5p M34D(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year, $0.15/copy.

Descriptors: *Industry surveys, *Industry shipments, *Metal cans, Tables(Data), Value of shipments.
Identifiers: *Current Industrial Reports.

Quantity of shipments of metal cans for sale and for own use, and kind of metal and shipments, are shown by type of product packed, census geographic areas, and census geographic divisions, for the current and preceding month, with comparative figures for the current month a year ago. A summary is included, showing quantity of shipments of metal cans (thousand base boxes) by type of customer, kind of metal (steel vs. aluminum) and principal type of cans, for the current month and each of 24 preceding months. Includes separate data for steel and aluminum cans for meat, soft drinks, beer, and 'other foods'; quantities in terms of number of cans as well as base boxes of cans; data on number of cans and value; and geographic regions to correspond with standard Census geographic regions.

COM-74-70057/6GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. ALUMINUM INGOT AND MILL PRODUCTS. JANUARY 1973.
Monthly rept.
Apr 73, 9p M33-2(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year, $0.15/copy.

Descriptors: *Industry surveys, *Industry shipments, *Aluminum ingots, *Aluminum mill products, Tables(Data), Value of shipments, Smelting industry, Metal scrap, Inventories, Imports for consumption, Aluminum industry.
Identifiers: *Current Industrial Reports.

For the current month and each of 24 preceding months, data are presented on: Quantity of receipts, consumption, and end-of-month inventories of consumers (manufacturers only); value of sales, and quantity and value of end-of-month inventories of service centers (warehouses); and quantity of inventories of steel in process and finished steel of producing mills.

COM-74-70058/4GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. SELECTED INDUSTRIAL AIR POLLUTION CONTROL EQUIPMENT.
Annual rept. for 1972.
Aug 73, 7p MA-35J(72)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $0.25/copy.

Descriptors: *Industry surveys, *Industry shipments, *Air pollution control equipment, Tables(Data), Orders(Commitments), Value of shipments, Particulate emissions, Gaseous emissions.
Identifiers: *Current Industrial Reports.

The report provides data on the shipments, backlog of orders, and new orders received of selected industrial air pollution control equipment used in the separation, removal, or collection of particulate and gaseous emissions. Data have been collected on two types of equipment: particulate emissions collectors and gaseous emissions control devices. Excluded from this survey is any equipment used to remove particulate matter from air for the comfort and protection of people, as in air conditioning, or the protection of scientific instruments, as in 'clean rooms' or any other allied or similar application. A summary table provides data on the value of shipments of selected industrial air pollution control equipment for 1972 and 1971, with comparative value figures from the 1967 Census of Manufactures.

COM-74-70059/2GA Not available NTIS
Bureau of the Census, Washington, D.C.
CURRENT INDUSTRIAL REPORTS. STEEL SHIPPING BARRELS, DRUMS, AND PAILS. JANUARY 1973.
Monthly rept.
Apr 73, 9p M34K(73)-1
Paper copy available from Bureau of the Census, Washington, D.C. 20233. $1.50/year, $0.15/copy.

Descriptors: *Industry surveys, *Industry shipments, *Steel shipping barrels, *Steel shipping drums, *Pails, Tables(Data).
Identifiers: *Current Industrial Reports.

The report presents data on quantity of shipments of steel pails and steel drums. Data on steel pails are shown by type of customer, type of head construction, type of lining, capacity, and end use. Data on steel drums are shown by type of customer, size, type of construction, and end use. Data are for the current and preceding month, with comparative data for the current month a year ago. A summary is included, showing producers' shipments of steel shipping barrels and pails, by type, for the current month and each of 24 preceding months.

PB-232 408/5GA PC$5.75/MF$1.45
Bureau of Labor Statistics, Washington, D.C.
BLS SEASONAL FACTOR METHOD (1966) SEAST. FORTRAN IV COMPUTER PROGRAM, John Early. 1966, 52p BLS/DF-73-005A
Also available as a magnetic tape, see also PB-230 425.

Descriptors: *Unemployment, *Time series analysis, *Computer programming, Economic analysis, Seasonal variations, Economic conditions, FORTRAN.
Identifiers: SEAST computer program, FORTRAN 4 programming language.

The SEAST program is designed to compute seasonal factors and seasonally adjusted data for monthly time series. The Bureau of Labor Statistics method is an interactive ratio-to-moving-average method which partitions the original series into three multiplicative components. It differs from similar methods in the following respects: The trend-cycle is obtained from the 12-month moving average by restoring any residual trend-cycle which finds its way into the irregular component. This adjustment for the deficiency of the moving average is developed explicitly and is made available for review in a table of trend-cycle correction values. The method allows for the possibility of changes in the irregular amplitude due to modifications in the producing mechanism or to economic changes. Each observation has a supplementary weight, called a credence factor, which is used in the various averaging processes.

PB-232 919/1GA PC$3.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
CONSEQUENCES OF CHANGING THE TAX DEDUCTIBILITY OF PROPERTY TAXES AND MORTGAGE INTEREST ON OWNER OCCUPIED HOUSES.
Final rept.,
Paul Taubman. 13 Jun 73, 37p* HUD-PDR-312

Descriptors: *Tax allowances, *Property taxes, *Interest, *Housing mortgages, Ownership, Prices, Housing markets, Tax structure, Tax credit, Rental housing, Econometrics, Economic models, Income taxes.
Identifiers: *Housing and urban development research.

It has been suggested that the deductibility of property taxes and interest payments on owner occupied houses be eliminated. In this paper the author examines the consequences of such a change on the quantity, quality, price and location of owner occupied and other housing and on closely related markets.

TT-71-54026/11-12 PC$7.25
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
PLANNED ECONOMY. VOLUME 26, NUMBERS 11-12, 1971.
1974, 311p
Trans. of Gospodarka Planowa (Poland) v26 n11/12 p627-765 1971, by Jerzy Bachrach. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Economic development, *Technical reports, *Poland, Translations, Periodicals, Economic development programs, Industries, Economic conditions.

The articles concern economic development programs, conditions and industries.

TT-71-54026/5-6 PC$6.75
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
PLANNED ECONOMY. VOLUME 26, NUMBERS 5-6, 1971.
1974, 300p
Trans. of Gospodarka Planowa (Poland) v26 n5/6 p257-392 1971, by Stella Woyciechowska, and Wojciech Charabin. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Economic development, *Technical reports, *Poland, Translations, Periodicals, Economic conditions, Economic development programs, Industries, Farms, Income, Investments.

The articles concern economic development programs, industries, standard of living, income, investments, and building construction.

TT-71-54026/7-8 PC$6.75
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.
PLANNED ECONOMY. VOLUME 26, NUMBERS 7-8, 1971.
1974, 292p
Trans. of Gospodarka Planowa (Poland) v26 n7/8 p393-520 1971, by Halina Markiewicz. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Economic development, *Technical reports, *Poland, Translations, Periodicals, Economic development programs, Industries, Food, Transportation, Economic conditions.

The articles concern economic development programs, conditions and industries.

TT-71-54026/9-10 PC$6.00
Department of Housing and Urban Development, Washington, D.C. Office of International Affairs.

PLANNED ECONOMY. VOLUME 26, NUMBERS 9-10, 1971.
1974, 240p
Trans. of Gospodarka Planowa (Poland) v26 n9/10 p521-636 1971, by Jerzy Bachrach and Halina Markiewicz. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Currency Science Information Program.

Descriptors: *Economic development, *Technical reports, *Poland, Translations, Periodicals, Economic development programs, Industries, Economic conditions.

Articles concern economic development programs, industries, housing, labor conditions, and mining.

5D. History, Law, and Political Science

AD-779 991/9GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
MILITARY CORRECTIONS AND JUSTICE IN A VOLUNTEER ARMY.
Student essay,
Philip M. Suess. 30 Jan 74, 25p

Descriptors: *Military law, Cost analysis, Military police, Army, Military personnel.
Identifiers: Crime, All volunteer armed forces.

The basic question is whether or not the Army should be operating a Correctional (Confinement) System as well as the 'Criminal' aspects of the current Military Justice System in view of the current 'peacetime volunteer army' environment and drastic manpower and budgetary restraints. The operating and personnel costs as well as the manpower drain imposed by these functions and their essentiality to 'combat readiness' in a peacetime volunteer army is examined. In view of the monetary and manpower drain they impose and their limited contribution to combat readiness during this period of fiscal restraint and wholehearted implementation of volunteer peacetime army standards, both, the corrections program and the criminal aspects of Military Justice, are considered non-essential to the Army mission. The possibility of transferring both functions to existing Federal civilian systems is recommended. (Author)

AD-779 992/7GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
A NATO EXTENDED CONFLICT WITHOUT MIDDLE EAST OIL.
Student essay,
Berlyn K. Sutton. 18 Oct 73, 25p

Descriptors: *Middle East, *Fuel oil, *NATO, Natural resources, Petroleum products, Threat evaluation, Conflict, Industries.

The paper evaluated the threat of loss of the Middle East petroleum resources to the NATO nations, and to analyze the nature of impact which such a loss would have upon the employment of a given NATO ground and tactical air force in an extended conflict. The reality of the threat, crude oil reserves, crude oil production, refining capacities, refined production, demand for refined production, and NATO force petroleum requirements were examined. (Modified author abstract)

AD-779 994/3GA PC$6.00/MF$1.45
Army War Coll Carlisle Barracks Pa
BORDER CONFLICT AS A FACTOR IN SINO-SOVIET RIVALRY.
Student essay,
Eugene A. Taylor. 27 Dec 73, 57p

Descriptors: *China, *USSR, *Conflict, Reviews, United States government, Foreign policy.

The question under consideration is the significance and role of the territorial boundary dispute existing between the Soviet Union and the People's Republic of China, and its impact on both the two principals as well as the ramifications for the United States. A detailed analysis and enumeration of Sino-Soviet border-relevant actions is presented for the period, 1969-1973. (Modified author abstract)

AD-779 999/2GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
THE IMPLICATIONS OF NEO-ISOLATIONISM ON MILITARY POLICY.
Student essay,
Howard R. Trenkle. 2 Jan 74, 24p

Descriptors: *United States government, *Foreign policy, *Isolation, Reviews.

The roots of isolationism, as a major theme in U.S. foreign and military policies over the years, are traced to the earliest days of national history. The aspects of present-day isolationist tendencies, and their effect upon military policy over the years, are examined and briefly critiqued. (Modified author abstract)

AD-780 000/6GA PC$4.50/MF$1.45
Army War Coll Carlisle Barracks Pa
OCEAN HARD MINERAL RESOURCES AND NATIONAL SECURITY PLANNING.
Student essay,
Robert E. Vansant. 22 Oct 73, 26p

Descriptors: *Minerals, *Ocean bottom, *National defense, Reviews, Continental shelves, Natural resources, Scientific research, International relations.

The study reviews the current state of the art regarding development of hard minerals from the deep seabed and outer continental margins, discusses the international legal climate for ocean floor mineral development, and assesses the impact of hard minerals from the ocean on national security planning. (Modified author abstract)

AD-780 001/4GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
THE USSR'S CURRENT ROLE IN THE MIDDLE EAST.
Student essay,
Leonard M. Wagman. 20 Oct 73, 34p

Descriptors: *USSR, *Middle East, United States government, NATO, Conflict, Israel, Arabia.

The basic question is whether the USSR's current posture in the Middle East is a threat to U.S. security. The essay shows the evolution of the present level of Soviet political and military activity in the Middle East, and the options open to the USSR in the remainder of the 70's. (Modified author abstract)

AD-780 002/2GA PC$4.00/MF$1.45
Army War Coll Carlisle Barracks Pa
THE UNITED STATES POLICY: 23 MATURE PARTNERSHIPS IN LATIN AMERICA.
Student essay,
Robert J. Wallace. 19 Oct 73, 20p

Descriptors: *Latin America, *United States government, *Foreign policy, Meetings, Agreements.
Identifiers: Economic development.

Since the end of the war in Vietnam the Administration appears to be looking more in the direction of Latin America. On 18 May 1973, during a seven-nation tour of Latin America, Secretary of State William P. Rogers made a speech in Bogota, Colombia, which was billed as a major policy announcement. The essay looks at whether or not the first two points of that speech are realistic and compatable. Basically the two points are (1) The United States will recognize the diversity of the 23 Latin American nations and deal with each separately; and (2) the United States relations with each nation will be 'as equal as friends can make them'. Special emphasis is given to the dynamics of Latin American nationalism to determine its impact on the two points being examined. (Modified author abstract)

AD-780 003/0GA PC$4.50/MF$1.45
Army War Coll Carlisle Barracks Pa
CREDIBLE DETERRENCE IN A SALT ENVIRONMENT.
Student essay,
William M. Williams, Jr. 7 Sep 73, 30p

Descriptors: *Arms control, *Deterrence, United States government, Foreign policy.
Identifiers: SALT(Strategic Arms Limitation Talks), Strategic arms limitation talks.

Two questions arise from the SALT agreements: How do they affect the 'sufficiency' theory, and what would be a credible deterrence under these agreements. The flaws of the SALT agreements have been examined in light of U.S. deterrent strength. The U.S. 'Nuclear Sufficiency' theory is examined under the current SALT agreements. The author's recommendations are in two parts. The first is on a credible deterrence under the SALT agreements, and is basically continued development and deployment of those weapon systems allowed under the agreements. The second recommendation concerns the current SALT II talks. Here, consideration should be given for U.S. allies, no give-in to the Soviets for the sake of arms control headlines, and the U.S. must have a credible deterrence and an indication of the will to use it if the need arises. (Modified author abstract)

AD-780 004/8GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
THE STRATEGIC IMPORTANCE OF THE PERSIAN GULF REGION TO THE UNITED STATES.
Student essay,
William B. Woods. 20 Oct 73, 33p

Descriptors: *United States government, *Middle East, *Gulfs, *Fuel oil, Foreign policy, Natural resources, USSR.
Identifiers: *Persian Gulf.

The essay examines the Persian Gulf region as a continuing source of oil to meet the energy requirements of the United States and the free world. Specifically, it investigates the importance of Gulf oil, the effects of the British withdrawal, and the external force at work in the area affecting the future United States strategic interests. (Modified author abstract)

AD-780 488/3GA PC$4.00/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME I. SUMMARY FINAL REPORT.
Herbert R. Hesse. Feb 74, 19p Rept no. AIM-74-T-4 ACDA/WEC-213-Vol-I
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 489.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Military operations, Strategy, Counter measures, Mathematical models, Computer programming.
Identifiers: SIR NEM system.

The work under this contract is reported in eight volumes, two of which have two parts. Volume I discusses the following topics: Methods for arms control analysis; rapid production model (RPM); SIR NEM; peripheral programs; and, support of agency analysis.

AD-780 489/1GA PC$6.50/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME II. THE RAPID PRODUCTION MODEL (RPM),
Norman H. Painter, and Martin E. Persky. Feb 74, 67p Rept no. AIM-74-T-5 ACDA/WEC-213-Vol-2
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 490.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Strategy, Mathematical models, Computer programs.
Identifiers: RPM(Rapid Production Model), Rapid production model, SIR NEM system.

RPM is a strategic nuclear exchange model. RPM offers to the user a wide variety of choices of global representations of offense, defense, target and geometric basing; of offense and defense systems; and of military event steps and data manipulation steps.

AD-780 490/9GA PC$14.75/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME III, PART I. DESCRIPTION STRATEGIC INTERNATIONAL RELATIONS NUCLEAR EXCHANGE MODEL (SIR NEM 9),
Harold Davis. Feb 74, 234p Rept no. AIM-74-T-6-Vol-3-Pt-1 ACDA/WEC-213-Vol-3-Pt-1
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 491.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Strategy, Computer programming, Mathematical models, Damage assessment, Kill probabilities, Vulnerability, Defense systems.
Identifiers: SIR NEM system.

SIR NEM (derived from Strategic International Relations Nuclear Exchange Model) is a simulation system involving a group of special purpose computer programs which serve as modules to be assembled according to the analysts' purposes and problems. This flexibility in assembling components makes it possible to apply the SIR NEM simulation system to a large variety of arms control problems involving weapon system analyses, and to conduct each analysis as is logically valid and with the desired detail, the necessary constraints, and the required precision. The SIR NEM system is designed to simulate the use of weapon and reconnaissance systems, including aircraft, missile, and satellite systems, from fixed or mobile bases on land and sea, against urban, industrial, or military targets.

AD-780 491/7GA PC$6.75/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME III, PART II. APPENDICES,
Harold Davis. Feb 74, 73p Rept no. AIM-74-T-6-Vol-3-Pt-2 ACDA/WEC-213-Vol-3-Pt-2
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 492.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Computer programming, Satellites(Artificial), Orbits, Defense systems, Kill probabilities, Vulnerability, Computations.
Identifiers: Fibonacci numbers, Random number generators, SIR NEM system.

Contents: Fibonacci numbers; Satellite orbital elements; Decimal conversion to binary bits; Mathematics of value targeting; Calculation of LEST; Inventory updating for sequential defense; Weapon radius using vulnerability number; Defense calculations; Computation of kill probability for functional fit; Calculations for PREFER; Sensor data; Computation of orbital elements; Calculations for ROUTE.

AD-780 492/5GA PC$16.50/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME IV. INPUT SECTIONS TO SELECTED SUBPROGRAMS,
Edward G. Richter, and Adelaide E. Bialek. Feb 74, 268p Rept no. AIM-74-T-9 ACDA/WEC-213-Vol-4
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 493.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Control sequences, Memory devices, Information retrieval, Defense systems, Damage assessment, Targets, Kill probabilities, Instruction manuals.
Identifiers: SIR NEM system, CDC 6600 computers, SIRNEM 9 computer program.

The report contains the following: Specific information for efficient computer use; CDC 6600 control cards (job file); MONITOR input; storage limitations for SIRNEM 9; and, input descriptions.

AD-780 493/3GA PC$5.50/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME V. OUTPUT SECTIONS TO SELECTED SUBPROGRAMS (SIR NEM 9),
Edward G. Richter, and Jimmie J. Nelson. Feb 74, 49p Rept no. AIM-74-T-7 ACDA/WEC-213-Vol-5
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 494.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Control sequences, Instruction manuals.
Identifiers: SIR NEM system, SIRNEM 9 computer program.

The report is designed to assist the analyst in reading and interpreting output print from the SIRNEM 9 Program. Individual tables and matrices that are output are labeled. SIRNEM 9 is controlled by an executive program, the MONITOR, which calls the program routines for execution. Standard print contains all input data, diagnostic messages, informative messages and a summary of the results of each routine that is executed.

AD-780 494/1GA PC$5.00/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME VI, PART A. A SERIES OF EXAMPLES TO DEMONSTRATE THE SIRNEM 9 PROGRAM TO THE NEW USER,
Jimmie J. Nelson. Dec 73, 38p Rept no. AIM-73-T-7 ACDA/WEC-213-Vol-6-Pt-A
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 495.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Computer programming, Instruction manuals.
Identifiers: SIR NEM system, SIRNEM 9 computer program.

The report should be construed as a tool to assist the analyst just beginning to use the program. It can be used as a vehicle to obtain a few printouts and practice runs as an initial departure point for confidence and training investigations.

AD-780 495/8GA PC$5.75/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME VI, PART B. INPUT AND OUTPUT DATA FOR THE SIRNEM 9 DEMONSTRATION EXAMPLES,
Jimmie J. Nelson. Dec 73, 52p Rept no. AIM-73-T-8 ACDA/WEC-213-Vol-6-Pt-B
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 496.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Input output processing, Targets, Kill probabilities, Allocations.
Identifiers: SIR NEM system, SIRNEM 9 computer program, Input output routines.

The report contains the listings of data cards and example outputs which are referenced by Volume 6 A, 'A Series of Examples to Demonstrate the SIR NEM 9 Program to the New User'.

AD-780 496/6GA PC$4.00/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME VII. THE TRANSLATOR PROGRAM,
Adelaide E. Bialek. Jan 74, 13p Rept no. AIM-74-T-3 ACDA/WEC-213-Vol-7
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 497.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Control sequences, Damage assessment, Targets.
Identifiers: SIR NEM system, TRANSLATOR computer program.

The Translator Program was developed early in the ACDA/WEC-213 contractual time period. The purpose of the program was to establish an automatic linkage between an RPM warhead allocation and SIR NEM. At that time, this was a way of using the capabilities of the RPM strike with the SIR NEM collateral assess for blast and fallout. In the span of time covered by the ACDA/WEC-213 contract both RPM and the Translator evolved. RPM now contains within itself a collateral assessment capability for blast and fallout.

AD-780 497/4GA PC$5.25/MF$1.45
Academy for Interscience Methodology Chicago Ill
MAINTENANCE OF STRATEGIC MODELS FOR ARMS CONTROL ANALYSIS. VOLUME VIII. THE FOZAUX PROGRAM,
Herbert R. Hesse. Feb 74, 41p Rept no. AIM-74-T-8 ACDA/WEC-213-Tol-8
Sponsored in part by Office of Naval Research contract N00014-70-C-0344. See also AD-780 488.

Descriptors: *Arms control, *Nuclear warfare, *Computerized simulation, Targets, Allocations, Kill probabilities.
Identifiers: SIR NEM system, FOZAUX computer program.

As a result of this research, the FOZAUX Program has been modified for use with a nuclear exchange model such as SIR NEM to facilitate obtaining five or less points on a 'drawdown kill curve' in one run.

PB-232 443/2GA PC$4.00/MF$1.45
New Mexico Univ., Albuquerque. Criminal Justice Program.
ALBUQUERQUE/BERNALILLO COUNTY FISCAL YEAR 1971 APPLICATIONS FOR LEAA DISCRETIONARY GRANTS,
William R. Partridge. 1971, 15p CJP-71-7
Grant LEAA-NI-71-050

Descriptors: *Law enforcement, *Project planning, *Urban planning, *New Mexico, Federal grants, Classifications, Laboratories, Police, Specialized training, Financing, Courts.

Identifiers: Application making, *Albuquerque(New Mexico), Bernalillo County(New Mexico).

Support for seven law enforcement projects was sought in New Mexico under the pilot cities program. These projects included Management Analysis of Criminal Justice Agencies, Metropolitan Narcotics Enforcement Unit, Crime Lab Survey, Team Policing Study, Police Training in Race and Cultural Relations, Spanish Language Course for the Albuquerque Police Department, and Psychological Consultation Program. Funds for staffing a planning and research program and a drug abuse education center were sought under the large cities special grant program. Projects sought under competitive grant programs included Police Salary Incentive for Education, The Intern Program for Law Students, Survey of Criminal Justice and the Indian in an Urban Environment, Quebrar Colony Halfway House, Alternative to Institutionalization for Youthful Offenders, An Early Intervention Drug Abuse Program, Solvent Inhaler Therapy, and A Youth Headquarters Program.

5E. Human Factors Engineering

LA-5488 PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
SELECTION OF RESPIRATOR TEST PANELS REPRESENTATIVE OF U.S. ADULT FACIAL SIZES.
A. Hack, E. C. Hyatt, B. J. Held, T. O. Moore, and C. P. Richards. Dec 73, 32p
Contract W-7405-eng-36

Descriptors: (*Respirators, *Testing), Face, Personnel.

For abstract, see NSA 29 12, number 29275.

5G. Linguistics

AD-780 112/9GA PC$4.00/MF$1.45
American Univ Washington D C Asian Language Center
VIETNAMESE PROTOTYPE COURSES.
15 Aug 72, 8p
Contract DAHC19-71-C-0068

Descriptors: *Language, *Courses(Education), Training, North Vietnam, South Vietnam.
Identifiers: Vietnamese language.

The report views the difficulties encountered in attempting to produce tapes for instructional courses in Vietnamese language.

AD-780 115/2GA PC$3.25/MF$1.45
System Development Corp Santa Monica Calif
INTERACTIVE SYSTEMS RESEARCH.
Interim rept. 1 Oct 73-31 Mar 74,
M. I. Bernstein. 30 Apr 74, 45p Rept no. SDC-TM-5243/001/00
Contract DAHC15-73-C-0080, ARPA Order-2254

Descriptors: *Natural language, *Speech recognition, *Man machine systems, Phonetics, Acoustics, Computer programming, English language, Data management.
Identifiers: Voice controlled data management system.

The continuing long-term goal of the SDC Speech Understanding Research (SUR) project is to develop and implement a data management system that is controlled and operated by its users through free-form spoken English. The basic approach taken to achieve this goal is distinguished by a modular system architecture that embodies phonological and linguistic processes and an acoustic-phonetic processor. The system architecture enables a complete assembly of multidirectional parsing processes to operate in parallel on the same or different segments of an input utterance.

AD-780 270/5GA PC$17.50/MF$1.45
International Training Consultants Inc Burbank Calif
INTERCULTURAL COMMUNICATION TRAINING MANUAL. VOLUME 1,
Eliot D. Bean, and Richard T. Brown. Aug 73, 290p
Contract DAAG05-72-C-0583
See also report Volume 2, AD-780 271.

Descriptors: *Social communication, *Cross culture(Sociology), Language, Training, Prototypes, Models, Manuals, Japan, Spain, Turkey, Venezuela.

The purpose of this manual is to provide a course development method that deals with all aspects of intercultural communication, not just the linquistic aspect. The first chapter orients the reader to the approach of the manual. Chapters Two and Three provide specific steps that guide the developer through all stages of course development. Chapter Four presents a model of communication processing, describes the kinds of information and processing abilities individuals must have, and gives recommendations for collecting this data. Chapter Five presents an outline of culture content and organization including topics which deal with the activities, practices, and technology of peoples as well as the groups they belong to; these topics are explained and exemplified, sources of cultural information are discussed, and a filing system for cultural data is provided. Chapter Six presents the empirically determined interaction modes and their realization in illustrative prototype models. (Modified author abstract)

AD-780 271/3GA PC$7.75/MF$1.45
International Training Consultants Inc Burbank Calif
INTERCULTURAL COMMUNICATION TRAINING MANUAL. VOLUME 2. APPENDIX,
Eliot D. Bean, and Richard T. Brown. Aug 73, 91p
Contract DAAG05-72-C-0583
See also Volume 1, AD-780 270.

Descriptors: *Social communication, *Cross culture(Sociology), Language, Training, Prototypes, Models, Manuals, Japan, Spain, Turkey, Venezuela.

The purpose of this manual is to provide a course development method that deals with all aspects of intercultural communication, not just the linguistic aspect. Appendix A presents a procedure for collecting and analyzing military data. Appendix B contains a summary of the military data upon which the manual is based. Appendix C presents an annotated bibliography. Appendix D is the glossary; included in the glossary are terms that are given a special meaning and are used in manual sections other than the one in which they are introduced. (Modified author abstract)

AD-780 355/4GA Not available NTIS
Mathematisch Centrum Amsterdam (Netherlands) Afdeling Informatica
STRUCTURE OF GROWTH IN LINDENMAYER SYSTEMS,
Paul M. B. Vitanyi. 27 Jan 73, 10p Rept no. IW-1/73
Availability: Pub. from Proceedings, Series A, v76, n3, and Indag. Math., v35 n3 1973.

Descriptors: *Language, *Mathematical logic, *Combinatorial analysis, Set theory, Recursive functions, Algorithms, Netherlands.
Identifiers: Automata theory.

Growth of word length in some rewriting systems (DOL's) is investigated by combinatorial arguments concerning the structure of production trees of individual letters. Several growth types are distinguished and algorithms are obtained to classify letters, DOL's and semi DOL's in these types. It is shown that polynomial growth can not occur without accompanying limited growth. A conceptually easy characterization of the nature of the different growth types is given, yielding expressions for the slowest growth possible in each growth type.

AD-780 442/0GA PC$3.25/MF$1.45
Rand Corp Santa Monica Calif
NATURAL LANGUAGE, LINGUISTIC PROCESSING, AND SPEECH UNDERSTANDING: RECENT RESEARCH AND FUTURE GOALS,
Allen Klinger. Dec 73, 51p Rept no. R-1377-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1

Descriptors: *Speech recognition, *Computational linguistics, Natural language, Artificial intelligence, Semantics, Pattern recognition.

The report contains a discussion of artificial intelligence, computer processing of natural-language data programming languages for problem-solving systems, and structural (contextual, linguistic) pattern recognition. It includes an in-depth survey of recent research results that includes examples of deduction, text recognition, and dialogue by and with computers followed by discussion of speech data, applications of understand-software, and suggestions for further research. (Modified author abstract)

5I. Personnel Selection, Training, and Evaluation

AD-779 827/5GA PC$3.25/MF$1.45
Yale Univ New Haven Conn Dept of Administrative Sciences
A NEW STRATEGY FOR JOB ENRICHMENT.
Technical rept.,
J. Richard Hackman, Greg Oldham, Robert Janson, and Kenneth Purdy. May 74, 40p* Rept no. TR-3
Contract N00014-67-A-0097-0026

Descriptors: *Job satisfaction, *Job analysis, *Motivation, Jobs, Organizations.
Identifiers: Design.

A new strategy for redesigning jobs to increase the work motivation and satisfaction of employees is described. Included is a statement of the theory on which the strategy is based, discussion of how to carry out and interpret a diagnosis of jobs prior to change, and specification of action steps for job redesign which have been found to lead to beneficial personal and organizational outcomes. The report, which is oriented primarily to managers and behavioral science practitioners in organizations, concludes with a summary of findings from organizational tests of the theory and the change strategy. (Author)

AD-779 828/3GA PC$4.00/MF$1.45
Yale Univ New Haven Conn Dept of Administrative Sciences
THE JOB DIAGNOSTIC SURVEY: AN INSTRUMENT FOR THE DIAGNOSIS OF JOBS AND THE EVALUATION OF JOB REDESIGN PROJECTS.
Technical rept.,
J. Richard Hackman, and Greg R. Oldham. May 74, 88p* Rept no. TR-4
Contracts N00014-67-A-0097-0026, DL-21-09-74-14
Prepared in cooperation with Illinois Univ., Urbana.

Descriptors: *Job satisfaction, *Job analysis, *Motivation, Jobs, Organizations, Management planning and control.
Identifiers: Design, Evaluation.

The report describes the Job Diagnostic Survey (JDS), an instrument designed to measure the following three classes of variables: (1) The objective characteristics of jobs, particularly the degree to which jobs are designed so that they enhance the internal work motivation and the job satisfaction

of people who do them; (2) The personal affective reactions of individuals to their jobs and to the broader work setting; and (3) the readiness of individuals to respond positively to 'enriched' jobs--i.e., jobs which have measured potential for generating internal work motivation. The JDS is based on a specific theory of how jobs affect employee motivation. It is intended for two general types of use: For diagnosing existing jobs to determine if (and how) they might be re-designed to improve employee productivity and satisfaction; and for evaluating the effect of job changes on employees--whether the changes derive from deliberate 'job enrichment' projects or from naturally-occurring modifications of technology or work systems. (Modified author abstract)

AD-779 879/6GA PC$5.00/MF$1.45
Alfred P Sloan School of Management Cambridge Mass
CAREER ANCHORS AND CAREER PATHS: A PANEL STUDY OF MANAGEMENT SCHOOL GRADUATES.
Technical rept. no. 1, Feb 73-Apr 74,
Edgar H. Schein. May 74, 36p
Contract N00014-67-A-0204-0073

Descriptors: *Personnel development, *Executives, *Careers, Supervisors, Performance(Human), Leadership, Management, Job satisfaction, Motivation.
Identifiers: Career ladders.

The report describes a ten year follow-up study of a sample of 44 graduates of the Sloan School of Management. A set of career anchors is conceptualized to describe the career dynamics of these men and some correlates of the career anchors are identified. (Modified author abstract)

AD-779 883/8GA PC$3.75/MF$1.45
Stanford Univ Calif Inst for Mathematical Studies in the Social Sciences
A RATIONALE AND DESCRIPTION OF THE BASIC INSTRUCTIONAL PROGRAM.
Technical rept. 1 Aug 72-31 Jul 74,
Avron Barr, Marian Beard, and Richard C. Atkinson. 22 Apr 74, 55p* Rept nos. TR-5, TR-228
Contract N00014-67-A-0012-0054, ARPA Order-2284

Descriptors: *Computer aided instruction, *Programmed instruction, Computer programming, Instructional materials, Individualized training, Teaching methods.
Identifiers: BASIC programming language.

A course in computer programming is being developed as a vehicle for research in tutorial modes of computer-assisted instruction. Methods for monitoring and aiding the student as he works on interesting programming problems are employed. The problems are individually selected via an optimization scheme based on a model of the student's ability and difficulties. After a brief overview of work done at Stanford in tutorial CAI and the teaching of procedural skills, the functional elements of the BASIC Instructional Program, its BASIC interpreter, curriculum, solution analysis, and interactive assistance during programming, are described. (Modified author abstract)

AD-779 912/5GA PC$3.25/MF$1.45
Applied Psychological Services Inc Wayne Pa Science Center
NONVERBAL AND CULTURE FAIR PERFORMANCE PREDICTION PROCEDURES. III. CROSS VALIDATION.
Rept. no. 1 (Final), Jul 71-Mar 74,
Arthur I. Siegel, and William Rick Leahy. Mar 74, 48p
Contract N00014-71-C-0319
See also AD-770 550.

Descriptors: *Naval personnel, *Aptitude tests, *Performance(Human), *Jobs, Aptitudes, Validation.
Identifiers: *Culture fair tests, *Nonverbal tests.

A cross validation of findings relative to the value of a fair test concept is presented. The concept is based on the conjecture that persons who demonstrate the ability to learn a sample of the tasks of a job will--given appropriate on-the-job training--be able to achieve an absolute proficiency criterion of job success. An initial validation (conducted after the sample had nine months job experience) had provided support for this contention. The cross validation (conducted after the sample had 18 months of job experience) similarly supported the contention. However, as anticipated, attenuation of predictive power was demonstrated in the 18-month cross validational followup. For the nine-month followup, the concept yielded discriminant functions which provided 74% correct classification. For the 18-month followup, 62% correct classification was demonstrated. (Author)

AD-779 950/5GA PC$3.75/MF$1.45
Mcdonnell Douglas Astronautics Co-East St Louis Mo
MEDIA ADJUNCT PROGRAMMING: AN INDIVIDUALIZED MEDIA-MANAGED APPROACH TO ACADEMIC PILOT TRAINING.
Final rept. Feb 72-Oct 73,
Barbara Leherissey McCombs, Ruth Ann Marco, Mark W. Sprouls, A. John Eschenbrenner, and Gary B. Reid. Mar 74, 67p AFHRL-TR-73-71(II)
Contract F41609-72-C-0015
See also report dated Jan 74, AD-775 723.

Descriptors: *Pilots, *Individualized training, *Teaching methods, Time, Learning, Anxiety, Performance(Human), Retention(Psychology), Analysis of variance, Optimization, Programmed instruction.
Identifiers: MAP(Media Adjunct Programming), Media adjunct programming, Pilot training.

Media Adjunct Programming (MAP) techniques for presenting individualized, self-paced instruction were compared to traditional instructor-classroom (TIC) techniques in an undergraduate pilot weather course. The MAP group completed the course in significantly less time than the TIC group, representing a 29% time savings. In addition, MAP students performed equally as well on the post-test and retention test, had significantly lower state anxiety scores while learning the materials and reported significantly higher attitude scores toward the instructional method than TIC students. Predictions on the inverse relationship between state curiosity and state anxiety were partially supported, in that significant interactions were found between treatment conditons and flight groups. Possible factors contributing to flight group differences were discussed. (Author)

AD-779 951/3GA PC$5.50/MF$1.45
Decision Systems Associates Inc Rockville Md
TRAINING LINE SIMULATOR (ENHANCED VERSION). USER'S MANUAL.
Final rept. Jan-Jun 73,
Richard S. Hatch, Michael Pierce, Franz Nauta, and Manuel Pina. Mar 74, 194p AFHRL-TR-73-50(I)
Contract F41609-72-C-0019
See also AD-779 952.

Descriptors: *Air Force personnel, *Air force training, *Computer programming, Planning, Computerized simulation, Network flows, Mathematical models, Simulators, Assessment, FORTRAN.

The Airman Training Line Simulator was designed as a managerial aid for investigating and evaluating the various and diverse policy interactions which impact on Basic Military Training and entry-level Technical Training courses. This user's manual provides user-oriented documentation in sufficient detail to give the prospective user a complete grasp of the concepts and logic underlying the model. The presentation includes: (a) A comprehensive overview of the system; (b) a description of the Simulator's modules and the interrelationships of their inputs and outputs; (c) detailed instructions on input card formats, with appropriate discussion as to the relationship between parameters and applications of the model; and (d) a description and explanation of reports generated by the Simulator and the relationship between individual input data items and output report items. (Author)

AD-779 952/1GA PC$3.75/MF$1.45
Decision Systems Associates Inc Rockville Md
TRAINING LINE SIMULATOR (ENHANCED VERSION).
Final rept. Jan-Jun 73,
Richard S. Hatch, Michael Pierce, Franz Nauta, and Manuel Pina. Mar 74, 71p AFHRL-TR-73-50(II)
Contract F41609-72-C-0019
See also AD-779 951.

Descriptors: *Air Force personnel, *Air force training, Planning, Computer programming, Network flows, Mathematical models, Assessment, Computerized simulation.

The report describes the technical aspects and potential applications of a computer-based model simulating the flow of airmen through basic training and entry-level technical training. The objective of the Training Line Simulator is to assess the impacts of alternative recruit classification and training policies under a wide variety of assumptions regarding the quality of recruits and the difficulty of training. Parameters accommodated by the model include mandatory as well as desirable course prerequisites, attrition, setback and washahead rates, class schedules and quotas, and a host of individual airman attributes. The model evaluates the effects of a given set of training parameters on a given recruit input by determining the maximum percent fills of training quotas, the size of the waiting lines for technical training courses, class sizes, student-instructor ratios and the numbers of setbacks, attritions, washaheads and unassigned basic training graduates at weekly intervals. (Modified author abstract)

AD-779 998/4GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
IMPROVED EFFECTIVENESS OF RESERVE FORCES DURING RESERVE DUTY TRAINING.
Student essay,
Harry H. Treadaway. 22 Oct 73, 35p

Descriptors: *Military reserves, *Job satisfaction, Motivation, Work, Recruiting, Retention(General), Army personnel, Management.

The problem areas of motivation, job enrichment, recruiting and retention are addressed from the viewpoint of the behavorial scientist. Special attention is given to relating job enrichment and motivation techniques, as successfully demonstrated in industry, to the United States Army Reserve. Research method utilized was a literature review correlating salient findings of attitude surveys with recent findings of behavorial scientists. Principal recommendations include better information to the prospective Reservist, utilization of attitude surveys, innovative training and job enrichment techniques. (Author)

AD-780 005/5GA PC$4.50/MF$1.45
Army War Coll., Carlisle Barracks, Pa.
MOTIVATION AND JOB SATISFACTION IN EXCHANGE THEORY TERMS.
Student essay,
Franklin M. Zabcik. 1 Oct 73, 27p

Descriptors: *Motivation, Job satisfaction, Personnel management, Leadership.

The question of human motivation has presented today's leader a major challenge. The young worker finds many of his basic needs fulfilled in an easier manner than previous generations; there-

fore, he strives for higher levels of self fulfillment. This essay develops three motivational theories and their relevant motivating factors are discussed. The understanding of the motivating factors by today's leaders at all levels is important in establishing an organizational climate in which a subordinate's motivational requirements and individual growth can be achieved. Examples of what industry has tried to improve, motivation and job satisfaction, and what today's younger generation has be to say about motivational factors are interwoven into various sections of the paper.

AD-780 206/9GA PC$6.50/MF$1.45
Navy Personnel Research and Development Center San Diego Calif
CONSOLIDATED BIBLIOGRAPHY NAVY PERSONNEL AND TRAINING RESEARCH. VOLUME I. UNCLASSIFIED REPORTS, FY 1949-FY 1963.
Final rept. 1949-1973,
William J. Stinson. May 74, 273p Rept no. NPRDC-TR-74-15-Vol-1
See also Volume 3, AD-780 207.

Descriptors: *Naval personnel, *Training, *Naval research, *Bibliographies, Human factors engineering, Manpower, Personnel management, Education, Costs.

The publication is part of a consolidated bibliography which lists all technical reports issued since 1949 by Navy personnel research organizations in San Diego and Washington, D.C. Abstracts are included where readily available from past records. The overall bibliography is divided into four volumes for handling convenience. Classified and unclassified reports are listed separately. Each volume covers a time period of approximately ten years. Within each volume, reports are listed in appropriate subject categories for reference convenience as follows: Manpower management, Personnel administration, Training and education, Human factors support, Resource costs, Bibliography reports. (Modified author abstract)

AD-780 207/7GA PC$9.25/MF$1.45
Navy Personnel Research and Development Center San Diego Calif
CONSOLIDATED BIBLIOGRAPHY: NAVY PERSONNEL AND TRAINING RESEARCH. VOLUME III. UNCLASSIFIED REPORTS, FY 1964-FY 1973.
Final rept. 1964-1973,
William J. Stinson. May 74, 471p Rept no. NPRDC-TR-74-15-Vol-3

Descriptors: *Naval personnel, *Training, *Naval research, *Bibliographies, Human factors engineering, Manpower, Personnel management, Education, Costs.

Contents: Manpower management; Personnel administration; Training and education; Human factors support; Resource costs; Bibliography reports.

AD-780 218/4GA PC$4.75/MF$1.45
Naval Postgraduate School Monterey Calif
A COMPUTER SIMULATION CASE FOR THE AUDITING CLASSROOM.
Technical rept.,
David C. Burns. Nov 73, 135p Rept no. NPS-55Bu73111A

Descriptors: *Inventory control, *Computerized simulation, *Teaching methods, Accounting, mathematical models, Computer programming, Monte Carlo method.

During fiscal year 1972, the writer developed an auditing case which is currently used in the course MN 4151 (Internal Control and Auditing) at the Naval Postgraduate School. This case involves complex auditing and internal control problems related to manufacturing inventories and it is based upon a computer simulation model. The report contains copies of all of the material which is necessary to implement the teaching approach described in an article entitled 'A Computer Simulation Approach for Teaching the Evaluation of Internal Control'. The purpose of this report is to make the simulation case available to auditing instructors at universities other than the Naval Postgraduate School. (Modified author abstract)

AD-780 223/4GA PC$3.75/MF$1.45
Naval Missile Center Point Mugu Calif
THE ROLE OF ORGANIZATIONS IN THE SOCIALIZATION OF EMPLOYEES.
Technical publication,
T. C. Lockhart. 3 Jun 74, 73p* Rept no. NMC-TP-74-28

Descriptors: *Human relations, *Social communication, Organizations, Behavior, Education, Employment, Personnel selection, Planning.

The study is concerned with the extent of socialization that takes place in large organizations. The Naval Missile Center, Point Mugu, California is used as a representative sample large organization. The Center's Equal Employment Opportunity program is the specific area of concentration of the study since it deals with a social problem. It has become a generally accepted fact that large organizations have a role in and a responsibility to the community for the social as well as economic aspects of society. The concept that these organizations systematically or otherwise, mold individual personality and behavior is receiving more attention and acceptance. The process by which this molding takes place is called socialization.

AD-780 410/7GA PC$8.50/MF$1.45
Navy Personnel Research and Development Center Washington D C
THE ROLE OF WOMEN IN THE NAVY: A STUDY OF ATTITUDES AND SCALE DEVELOPMENT.
Final rept.,
Carol H. Fuller. Jun 73, 107p Rept no. WTR-73-41

Descriptors: *Naval personnel, *Females, *Negroes, Attitudes(Psychology), Discrimination, Minorities, Acceptability, Surveys.

The research represents an attempt to better understand negative and positive attitudes toward expanding the role of women in the Navy. The research includes two phases. In the first phase, reports of discrimination and of stereotyped, prejudicial attitudes were investigated. The relationship between these reports and characteristics such as race, sex, education, and career motivation was analyzed. In the second phase, an attempt was made to differentiate components of attitudes toward expanding the role of Navy women. Such attitudes are expected to be determined both by beliefs as to what roles women can perform and by feelings about what roles women should perform. In addition, in the second phase, the usefulness of several attitude items for measuring these components was assessed.

AD-780 438/8GA PC$3.75/MF$1.45
Navy Personnel Research and Development Center San Diego Calif
NON-COGNITIVE FACTORS AS PREDICTORS OF INDIVIDUAL SUITABILITY FOR SERVICE IN THE U. S. NAVY.
Final rept.,
Samuel E. Bowser. Apr 74, 52p Rept no. NPRDC-TR-74-13

Descriptors: *Recruiting, *Enlisted personnel, *Personnel selection, Navy, Reenlistment, Biographies, Bayes theorem, Decision making, Questionnaires, Computer programming.
Identifiers: CHAROSEL computer program.

The study is a pilot utilizing non-cognitive data sources in the prediction of individual suitability for service in the U.S. Navy. A methodology was developed which enables a logical selection of subsets of categorical predictors to optimize the prediction of suitability for service. The results support the contention that non-cognitive data sources are important and useful in prediction of success in the U.S. Navy. (Author)

AD-780 448/7GA PC$4.00/MF$1.45
American Institutes for Research Silver Spring Md
IMPROVING READING COMPREHENSION: MEASURING READABILITY.
Final rept. 15 Feb 72-15 Mar 74,
Ronald P. Carver. 14 May 74, 91p Rept nos. AIR-R74-2, AIR-30801-5/74-FR
Contract N00014-72-C-0240

Descriptors: *Reading, *Programmed instruction, Data storage systems, Attention, Difficulty.
Identifiers: *Comprehension, Prose, Cloze procedure.

A standardized method, called programmed prose, has been developed which can be used to automatically convert prose training material into a form which forces trainees to read the material with at least a minimal level of comprehension. A new method for measuring prose difficulty, called the Rauding Scale of Prose Difficulty, was also developed and investigated so that the effect of the reading ability and reading difficulty differences could be better measured. The Rauding Scales was found to correlate higher with the actual grade level where curriculum passages were used in school than six other readability measures. (Modified author abstract)

AD-780 516/1GA PC$4.75/MF$1.45
Illinois Univ Urbana
DEVELOPMENT AND IMPLEMENTATION OF THE COMPUTER ASSISTED INSTRUCTION STUDY MANAGEMENT SYSTEM (CAISMS).
Technical rept. 1 Jan 73-1 Jan 74,
Stephen M. Allessi, Richard C. Anderson, Thomas H. Anderson, W. Barry Biddle, and Bruce R. Dalgaard. Feb 74, 126p NPRDC-TR-74-29
Contract N61339-73-C-0078

Descriptors: *Learning, *Computer aided instruction, Management, Test construction(Psychology), Attention, Manuals.
Identifiers: CAISMS(Computer Assisted Instruction Study Management System), Computer assisted instruction study management system, Instructional materials.

The purpose of the study was to design, tryout, and evaluate a system for maintaining attentive study of instructional materials. A CAI system was used for this purpose but, in contrast to most CAI efforts, existing materials were used and students spent minimal time in on-line contact with the computer. The report includes a manual of procedures for preparing test items which maintain attentive study, evaluation of the system, cost projections for use of the system, and a suggested extention of the system. (Modified author abstract)

COM-74-50522/3GA PC-GPO/MF$1.45-NTIS
Economic Development Administration, Washington, D.C.
THE POTENTIAL OF HANDCRAFTS AS A VIABLE ECONOMIC FORCE - AN OVERVIEW.
May 74, 56p
Paper copy available from GPO $0.65.

Descriptors: *Crafts, *Marketing, Craftsmen, Skills, Financing, Designers, Economic factors, Operating costs, Blighted areas.
Identifiers: *Handicrafts, Design crafts.

Handcrafts are considered to be an emerging and viable economic force, but their impact must be viewed relative to their setting. They often may generate jobs and income in areas that offer only meager alternatives. Handcrafts preserve our na-

tional folk heritage, contribute to our cultural traditions, and provide both recreational and therapeutic benefits to handicapped persons, the elderly, and others. Crafts can be produced, individually, by sophisticated urban-oriented artisans and by isolated mountaineers; by urban or rural cooperatives; by such ethnic groups as Indians, Mexican-Americans, and Alaskan Natives; and by craft centers, where volume production is combined with hand skills. There is growing market for quality crafts that can be supplied in quantity and dependably.

PB-232 561/1GA PC$4.75/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
PLLDO: THE DO LOOP IN PL/1. A LESSON FOR PLATO IV,
Barry Sholem Finkel. May 74, 33p UIUCDCS-R-74-644

Descriptors: *Specialized training, *Computer programming, Program design, Program descriptions, Methodology, Evaluation, Flow charts, FORTRAN, PL/1 programming language, Theses.
Identifiers: *Computer aided instruction, Man computer communication, PLATO 4 system, pldo computer lesson.

pldo is a lesson written for the PLATO IV computer aided instruction system and designed to teach fundamentals of PL/1 DO loops. This report describes the design considerations, structure, content, drills, programming techniques, and student evaluation of the lesson.

5J. Psychology (Individual and Group Behavior)

AD-779 898/6GA PC$3.00/MF$1.45
Columbia Univ New York Psychophysics Lab
DYNAMIC DEPTH PERCEPTION UNDER LABORATORY AND FIELD CONDITIONS.
Final scientific rept.,
Eugene Galanter. Mar 74, 17p Rept no. PLR-30
Contract DADA17-68-C-8065

Descriptors: *Space perception, Long range(Distance), Aircraft, Observation, Approach, Ground vehicles.

The research was designed to assess the relations between judgments that people make and metric features of the environment (physical distance). Experiments were performed in which people made judgments of the vertical distance to an airplane that flew overhead at varying altitudes. A pilot experiment is reported of slant range judgments to aircraft at varying distances, at angles of thirty and sixty degrees above the horizon. Results of one experiment are included. These results show that judgments of time-to-touchdown of motion-picture simulations of landing approaches are unaffected by the experience of the observer or the steepness of the approach. (Modified author abstract)

AD-780 096/4GA PC$3.00/MF$1.45
Naval Submarine Medical Research Lab Groton Conn
VISIBILITY OF COLORED TARGETS IN FREE-SWIMMING SCUBA SEARCH.
Interim rept.,
S. M. Luria, and Jo Ann S. Kinney. 1 Feb 74, 8p Rept no. NSMRL-769

Descriptors: *Searching, *Underwater, *Visibility, *Scuba diving, Colors, Visual perception.

SCUBA divers searched a lake bed for randomly-positioned targets painted with various colors. The percentage of each color retrieved was tabulated. Results conformed to predictions based on the results of previous highly controlled experiments and show that these data have practical applicaton in underwater search situations. (Author)

AD-780 116/0GA PC$3.25/MF$1.45
Utah Univ Salt Lake City Dept of Psychology
AN ANALYSIS OF FACTORS INFLUENCING ALCOHOL CONSUMPTION OF ALCOHOLIC RATS.
Annual rept. no. 4,
Harold C. Nielson. Dec 73, 50p
Contract DADA17-73-C-3058

Descriptors: *Alcoholism, Psychophysiology, Alcohols, Ingestion(Physiology), Rats, Stress(Physiology), Taste, Conditioning(learning), Food deprivation, Experimental data, Medical research, Behavior.
Identifiers: *Alcohol injestion, Animal behavior.

Seven experiments are reported which are part of a research project to understand factors that influence alcohol consumption of rats and to develop techniques that will make the rat the counterpart of the human alcoholic. In the first two experiments investigated the role that taste and caloric stress play in influencing alcohol consumption of rats. The rats in these experiments were individually housed in activity wheels, placed on 23.5-hour feeding schedules and offered ad lib access to water and to beer that had various concentrations of alcohol added. The results showed that rats drank preferred beer-alcohol solutions to alleviate caloric stress that resulted from living in the activity wheels on the restricted feeding schedule. When the caloric stress could not be alleviated by drinking a preferred lower-alcohol-containing solution the rats voluntarily drank sufficient quantities of nonpreferred beer-alcohol solutions that contained higher amounts of ethanol. (Modified author abstract)

AD-780 216/8GA PC$4.50/MF$1.45
Naval Submarine Medical Research Lab Groton Conn
RTLAB: A REACTION-TIME LABORATORY FOR THE DATA GENERAL NOVA MINICOMPUTER.
Medical research progress rept. no. 5,
Gary M. Olson, George Moeller, and Kevin Laxar. 7 Aug 73, 125p Rept no. NSMRL-748

Descriptors: *Reaction(Psychology), *Computer programs, *Behavioral science, Minicomputers, Computer applications, Stimuli, Reaction time.
Identifiers: RTLAB computer program, NOVA computer.

RTLAB is a package of relocatable assembly-language subroutines for the design, control, and analysis of behavioral experiments on the Data General Corporation NOVA family of computers. It was originally designed for use in reaction time research but is readily adaptable to any discrete-trial task. RTLAB accepts design parameters from the experimenter for a given experiment and then produces an appropriately randomized and counterbalanced set of trials for presentation to a subject. During an experimental session RTLAB controls the presentation of stimuli, the acceptance and scoring of responses, and all of the timing and input-output constraints associated with control and data acquisition. Its current design does not allow for time-sharing among more than one subject station. A history of the experiment is saved for later analysis and transfer to storage media. User modifications of any of the details of these operations are facilitated by the organization of RTLAB into subroutine modules. The organization of RTLAB and its use are presented along with sufficient documentation of the routines to allow user modification where appropriate. (Author)

AD-780 240/8GA PC$3.75/MF$1.45
Purdue Univ Lafayette Ind
ATTRIBUTIONS OF SOCIAL CAUSALITY AND RESPONSIBILITY.
Technical rept.,
Glenda Y. Nogami. Nov 73, 68p Rept no. TR-15
Contract N00014-67-A-0026-0030

Descriptors: *Behavior, *Decision making, Motivation, Performance(Human), Environments, Statistical processes, Correlation techniques, Attitudes(Psychology).
Identifiers: *Attributions of causality.

The paper reviews relevant research on attributions of causality and attributions of responsibility. It is suggested that inconsistencies among findings in the attribution literature may be due to discrepancies between the meaning of 'responsibility' and 'causality'. Definitions for the two terms are proposed. An analysis of the literature in the area suggests that a distinction between research methods leading to causality attribution as opposed to responsibility attribution may serve to eliminate some of the problems in attribution research. (Author)

AD-780 242/4GA PC$3.00/MF$1.45
Purdue Univ Lafayette Ind
REINFORCEMENT SCHEDULES, ATTRIBUTION OF CAUSALITY AND EXPECTATIONS OF SUCCESS.
Technical rept.,
Susan C. Streufert, and Glenda Y. Nogami. Apr 74, 24p Rept no. TR-19
Contract N00014-67-A-0026-0030

Descriptors: *Behavior, Conditioned reflex, Reaction(Psychology), Performance(Human), Stimulation(Physiology).
Identifiers: *Attributions of causality, *Reinforcement schedules, Expectation, Success and failure.

Much recent research on attribution of causality for success has reported that subjects, in general, attribute success to internal, rather than external sources. In addition, evidence has been found that expectation of success, or confidence, is associated with internal attributions for success. An experiment was designed to answer three basic questions: Can similar results for attribution and expectation of success be obtained in a more complex task than those most often used previously, under differing reinforcement schedules, and over task participation of long duration. Success input, in any of several different patterns, produces higher and increasing attributions of causality to internal than to external sources; success input, in any of several different patterns, produces increasing expectations of future success. (Modified author abstract)

AD-780 246/5GA PC$3.25/MF$1.45
Perceptronics Inc Woodland Hills Calif
ADAPTIVE COMPUTER AIDING IN DYNAMIC DECISION PROCESSES: PART II. SCENARIO GENERATION BY ELICITED EXPERT PROBABILITIES.
Semi-annual technical rept. 1 Oct 73-1 Apr 74,
Amos Freedy, Donald May, Richard Weisbrod, and Gershon Weltman. 1 May 74, 38p Rept no. PTR-1016-74-5(II)
Contract N00014-73-C-0286
See also report dated 1 Oct 73, AD-769 113.

Descriptors: *Decision making, *Learning machines, *Computer applications, Adaptive systems, Man machine systems, Intelligence, Statistical decision theory, Bayes theorem, Mathematical models.
Identifiers: Scenarios.

The report describes the implementation of a system for adaptive computer aiding in dynamic decision processes and provides theoretical background for some of the underlying techniques. The report is presented in two parts under separate covers. 'Scenario Generation by Elicited Expert Probabilities,' describes a unique technique for generating realistic dynamic decision environments. It covers the following topics: (1) a review of requirements for and techniques of generating scenarios; (2) a description of the elicited expert probability approach; (3) a description of the system for generating fishing fleet

scenarios and the associated hardware and software. The report was prepared as part of a long term program directed toward the application of adaptive computer techniques for aiding the decision maker and toward the experimental investigation of the factors which influence optimal decision aiding in complex, realistic, intelligence-gathering tasks. (Modified author abstract)

AD-780 272/1GA PC$7.00/MF$1.45
Florida Univ Gainesville
ATTITUDES, BEHAVIORS, AND EFFECTIVENESS OF BLACK AND WHITE LEADERS OF SIMULATED PROBLEM SOLVING GROUPS OF VARYING SIZE AND RACIAL COMPOSITION.
Technical rept.,
Walter A. Hill, and William R. Allen. Apr 74, 80p
Rept no. TR-74-1
Contract N00014-68-A-0173-0019
Prepared in cooperation with Rhode Island Univ., Kingston.

Descriptors: *Attitudes(Psychology), *Race relations, *Leadership, Negroes, Caucasians, Naval personnel, Test methods, Variations, Background, Questionnaires, Data reduction, Statistical analysis, Performance(Human), Group dynamics.
Identifiers: *Recruits, Puerto Ricans.

A field experiment was used to investigate the effects, if any, of changing group size and racial composition on the attitudes, behaviors, and effectiveness of black and white leaders. Subjects were 288 naval recruits, half black and half white, performing two tasks which were watched by a pair of racially mixed observers through a one way mirror. The results obtained in the dyads tended to corroborate findings of an earlier laboratory experiment which indicated few differences between black and white leaders. The reasons for some differences are not apparent from the data collected in the experiment, but some possible explanations are offered.

AD-780 323/2GA Not available NTIS
Defence and Civil Inst of Environmental Medicine Downsview (Ontario)
TACTICAL PERCEPTION OF TEXTURE.
Research paper,
M. M. Taylor, S. J. Lederman, and R. H. Gibson. 1973, 23p Rept no. DCIEM-RP-820
Availability: Pub. in Handbook of Perception, v3 p251-272 1973.

Descriptors: *Touch, *Texture, *Perception, Psychophysiology, Scientific research, Canada.

Touch is old and intimate, and ill understood. Whether or not hearing evolved from a touch-like vibratory sense, the touch of which we are possessed is complex. A partial list of object properties readily determined by touch and not by vision or hearing might include temperature, hardness, roughness, elasticity, stickiness, slipperiness, rubberiness, the homogeneity of what lies under the surface, and so forth. Combinations of these properties are together perceived as texture, and texture, not form alone, is the prime province of touch. The perception of texture by touch is at least as complex as the perception of auditory qualities, and may well prove to be more so.

AD-780 405/7GA PC$5.50/MF$1.45
Naval Postgraduate School Monterey Calif
A NEW APPROACH TO PILOT RATING SCALES.
Master's thesis,
Coral Vance Schufeldt. Sep 71, 47p

Descriptors: *Pilots, *Ratings, *Scaling factors, Feasibility studies, Hypotheses, Performance(Human), Numerical methods and procedures, Scale, Theses.

An examination and comparison of pilot rating scales presently in use and an investigation into the possibilities of a linear rating scale were conducted. The hypothesis was advanced that a rater may transpose his impression of performance directly to a non-adjectival, non-ordinal rating scale and thereby relate his psychological continuum to a numerical index. Experimental data, though limited, tended to support this hypothesis. (Author)

AD-780 439/6GA PC$3.00/MF$1.45
Navy Personnel Research and Development Center San Diego Calif
DEVELOPMENT OF A SOCIAL DISTANCE SCALE.
Final rept.,
Aaron Katz, and Paul P. Foley. Apr 74, 22p Rept no. NPRDC-TR-74-23

Descriptors: *Social communication, *Enlisted personnel, Overseas, Human relations, Cross culture(Sociology), Navy, Community relations.
Identifiers: Homeporting.

A pool of 34 items was presented to 276 enlisted personnel for evaluation of the degree of personal interaction implied in each statement. The distribution of judgments resulting from this procedure served as a basis for establishing social distance scale values through use of the method of successive intervals. Nine items were selected for the final scale on the basis of having met the following criteria: (1) coverage of a wide range of closeness in personal interaction, (2) non-overlapping of item content, and (3) approximately equal size in social distance between items. Stability for the items was established by correlating the scale values based on random halves of the total sample (rho = .97). This scale, designed to measure willingness to engage in social contact with host country nationals, will be incorporated into survey instruments covering issues of living in an overseas environment. (Author)

AD-780 444/6GA PC$3.00/MF$1.45
Maryland Univ College Park Dept of Psychology
PSYCHOPHARMACOLOGICAL EFFECTS OF ALCOHOL.
Annual progress rept. no. 1, 1 Jul 73-30 Jun 74,
James E. Barrett. 15 Jun 74, 12p
Contract DADA17-73-C-3126

Descriptors: *Behavior, *Drugs, Monkeys, Alcohols, Ingestion(Physiology), Experimental data.
Identifiers: *Alcohol ingestion, Chlordiazepoxide, *Psychoneuropharmacology.

Techniques capable of inducing excessive alcohol ingestion by squirrel monkeys were experimentally examined. Using primarily schedule-induced drinking, it was possible to engender the drinking of substantial quantities of alcohol. The effects of alcohol on various behaviors was also examined, as were the effects of chloridazepoxide on alcohol drinking. Alcohol increased punished responding, and decreased responding maintained by aversive stimuli. Chlordiazepoxide increased the amount of alcohol ingested. (Author)

AD-780 458/3GA PC$3.75/MF$1.45
Educational Testing Service Princeton N J
PSYCHOMETRIC TESTS AS COGNITIVE TASKS: A NEW 'STRUCTURE OF INTELLECT'.
Technical rept.,
John B. Carroll. 15 May 74, 58p Rept nos. ETS-RB-74-16, TR-4
Contract N00014-71-C-0117

Descriptors: *Psychological tests, Analysis of variance, Factor analysis, Theory, Memory(Psychology).
Identifiers: *Cognition.

After consideration of the drawbacks of such psychometrically derived theories of cognitive abilities as those of Guttman, Cattell, and Guilford, appeal is made to E. B. Hunt's 'distributive memory' model and A. Newell's concept of the 'production system' as possible bases for developing an alternative theory. Such a theory of cognitive abilities rests upon the individual differences displayed in the parameters of the tasks found in typical tests of intelligence. As first step toward developing a new 'structure of intellect' model, a detailed subjective analysis is made of the cognitive processes involved in two tests designed to measure each of the 24 factors in the 1963 version of the 'Kit of Reference Tests for Cognitive Factors'. It is held that the study of individual differences in abilities can profit greatly if it is closely tied to the experimental analysis of particular cognitive tasks; at the same time, work in the experimental tradition should pay close attention to the problem of identifying sources of variance that are due to individual differences in task parameters. (Modified author abstract)

AD-780 515/3GA PC$3.00/MF$1.45
Illinois Univ Urbana
RETENTION OF TEXT INFORMATION AS A FUNCTION OF THE NATURE, TIMING, AND NUMBER OF QUIZZES.
Technical rept. 1 Feb 73-1 Sep 73,
Richard C. Anderson, John R. Surber, W. Barry Biddle, Peter M. Zych, and Claire E. Lieberman. Feb 74, 23p NPRDC-TR-74-28
Contract N61339-73-C-0078

Descriptors: *Retention(Psychology), *Psychological tests, Recall, Learning, Memory(Psychology).
Identifiers: Short term memory.

In two experiments a total of 662 high school students read a prose passage, took a verbatim or paraphrase quiz, and a week later completed a verbatim or paraphrase delayed test. Taking a quiz significantly enhanced performance on the delayed test. Performance was consistently much higher on the verbatim than the paraphrase forms of quizzes and tests. Fitting the DATA RATHER WELL WAS A THEORY WHICH ASSUMES THAT A VERBATIM QUESTION IS BEST AT EVOKING RETRIEVAL OF PHONOLOGICALLY CODED INFORMATION IN SHORT TERM MEMORY WHEREAS A PARAPHRASE QUESTION IS BEST AT INSTIGATING TRANSFER OF THE INFORMATION INTO LONG-TERM, SEMANTIC MEMORY. (Author)

PB-232 111/5GA PC$8.25/MF$1.45
Psychological Research Foundation of Vermont, Inc., Burlington.
ALCOHOL, DRUGS, AND DRIVING.
Final rept. 1972-1973,
M. W. Perrine. Mar 74, 394p* DOT-HS-801 096
Contract DOT-HS-265-2-489

Descriptors: *Alcoholism, *Drugs, *Motor vehicle operators, *Meetings, Sensory deprivation, Thresholds(Perception), Visual perception, Attention, Motivation.
Identifiers: Drinking drivers, Alcohol effects, Drug effects.

The basic purpose of the Vermont Symposium was publication of the proceedings to incorporate the following specific aims: (1) Systematic, evaluative reviews of the eight major aspects of alcohol and drug problems related to highway safety, with each review written by a leading specialist in that aspect; (2) a synthesis of the edited transcriptions of the discussion periods that followed presentation of the summaries of each of the eight review papers; and (3) ratings of 176 keyword topics on three dimensions of alcohol, drug, and driving problems, i.e., the extent of present knowledge, the relative priorities for basic research in terms of informational yield, and the relative priorities for applied research in highway safety. The critical reviews consist of combinations of the following topics: Alcohol and/or drug influences upon driving-related behavior as studied in laboratory, simulator, and closed-course driving experiments; epidemiologic studies of the

role of alcohol and/or drugs in highway crashes and citations; and research on countermeasures for alcohol and/or drug involved problems on the highway.

5K. Sociology

AD-780 252/3GA PC$6.00/MF$1.45
Edaw Inc San Francisco Calif
HISTORICAL AND CULTURAL DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 57p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 253.

Descriptors: *Land areas, *Recreation, *History, *Texas, Global communication systems, Extremely low frequency, Sites, Culture, Archaeology, Law, Indexes.
Identifiers: *Sanguine project, Parks.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles westnorthwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 253/1GA PC$5.00/MF$1.45
Edaw Inc San Francisco Calif
POPULATION AND DEMOGRAPHIC DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 39p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 254.

Descriptors: *Population, *Demography, *Texas, Global communication systems, Extremely low frequency, Sites, Sociology, Housing(Dwellings), Predictions, Employment, Industries, Rural areas, Urban areas, Tables(Data).
Identifiers: *Sanguine project, Income.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles westnorthwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 259/8GA PC$4.75/MF$1.45
Edaw Inc San Francisco Calif
POPULATION AND DEMOGRAPHIC DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 34p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 260.

Descriptors: *Population, *Demography, *Michigan, Global communication systems, Extremely low frequency, Sites, Employment, Sociology, Predictions, Industries, Housing(Dwellings), Urban areas, Rural areas, Tables(Data).
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 288/7GA PC$5.75/MF$1.45
Edaw Inc San Francisco Calif
HISTORICAL AND CULTURAL DATA OF THE WESTERN UPPER PENINSULA REGION, MICHIGAN: PROJECT SANGUINE.
Feb 74, 52p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 289.

Descriptors: *Land areas, *Recreation, *History, *Michigan, Global communication systems, Extremely low frequency, Sites, Culture, Archaeology, Rivers, Lakes, Natural resources, Law.
Identifiers: *Sanguine project, Parks.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 328/1GA Not available NTIS
National Research Council of Canada Ottawa (Ontario)
DYNAMIC INTERFACING,
W. H. C. Simmonds. 1973, 8p Rept no. NRC-13482
Availability: Pub. in Technology Assessment, v1 n4 p237-243 1973.

Descriptors: *Technology, *Human relations, Interfaces, Assessment, Forecasting, Interactions, Canada.
Identifiers: Quality of life, Values.

The objective of the report is to present a new way for handling socio-technical problems, termed dynamic interfacing, using a new criterion, humanness-in-living (HIL) for evaluation and decision making. In dynamic interfacing, separate forecasts are made for those areas of the problem or project for which 'hard' data are available, the techno-GNP-economics area, and for those areas for which only 'soft' data are available, the socio-social economics area. The two sets of forecasts are compared for match-mismatch and evaluated for their effects on humanness-in-living. The method ensures that the technical, hard economic, social economic, human, social, and organizational contexts of a problem are simultaneously, and not sequentially, considered in the evolution of its solution.

COM-74-11054/5GA PC$11.00/MF$1.45
Bureau of the Census, Washington, D.C.
CONGRESSIONAL DISTRICT DATA FOR THE 94TH CONGRESS. A COMPUTER PROFILE. TEXAS, DISTRICTS 1-24.
Redistricted 17 Oct 73.
Jun 74, 591p CENSUS-72-94-39
Supersedes CENSUS-72-93-39, COM-72-10275-39. 1970 Census Data.

Descriptors: *Demography, *Texas, *Residential buildings, *Elections, *Census, *Congressional district data, Statistical data, Populations.

The report is one of a series of separate computer generated statistical profiles for congressional districts of the 94th Congress. It includes selected data or demographic, economic, and housing characteristics for the state of Texas and its 24 congressional districts. Data are presented in both narrative and tabular form. The statistics are derived from the 15% and 5% sample questionnaires used in the 1970 census. Some items appeared on both sample questionnaires and, therefore, are based on a 20% sample of the population. The population figures show the number of persons in the state and each congressional district by race, age, sex, education, income, employment, and country of origin of foreign stock. Statistics on tenure, plumbing, value, and rent are shown in the housing data. State maps showing congressional district boundaries are also included.

COM-74-11055/2GA PC$21.00/MF$1.45
Bureau of the Census, Washington, D.C.
CONGRESSIONAL DISTRICT DATA FOR THE 94TH CONGRESS. A COMPUTER PROFILE. CALIFORNIA, DISTRICTS 1-43.
Redistricted 28 Nov 73.
Jun 74, 1057p CENSUS-72-94-04
Supersedes CENSUS-72-93-04, COM-72-10275-04.

Descriptors: *Demography, *California, *Residential buildings, *Elections, *Census, *Congressional district data, Statistical data, Populations.

The report is one of a series of separate computer generated statistical profiles for congressional districts of the 94th Congress. It includes selected data on demographic, economic, and housing characteristics for the state of California and its 43 congressional districts. Data are presented in both narrative and tabular form. The statistics are derived from the 15% and 5% sample questionnaires used in the 1970 census. Some items appeared on both sample questionnaires and, therefore, are based on a 20% sample of the population. The population figures show the number of persons in the state and each congressional district by race, age, sex, education, income, employment, and country of origin of foreign stock. Statistics on tenure, plumbing, value, and rent are shown in the housing data. State maps showing congressional district boundaries are also included.

COM-74-11069/3GA PC$5.50/MF$1.45
National Bureau of Standards, Washington, D.C. Applied Acoustics and Illumination Section.
USER REQUIREMENTS IN THE HOME - DATA COLLECTION METHODOLOGY -- A STATE OF THE ART REPORT.
Final rept.,
Arthur I. Rubin, and Jacqueline Elder. Dec 71, 194p NBS-10852

Descriptors: *Houses, *User needs, *Surveys, Questionnaires, Interviews, Ratings, Observation, Illuminating, Heating, Air conditioning, Vibration, Odor control, Noise(Sound).

The first part of the report focuses on the design, construction and administration of questionnaires. The second part covers methods to indicate the variety of techniques that might be used by research. The report provides the survey research in user requirements with a fairly thorough compilation of the tools available to collect data.

COM-74-70004-090/GA PC-GPO
Bureau of the Census, Washington, D.C.
CURRENT POPULATION REPORTS. CONSUMER INCOME. MONEY INCOME IN 1972 OF FAMILIES AND PERSONS IN THE UNITED STATES.
Dec 73, 173p P-60/90
Paper copy available from GPO $14.00/year including series P-20, P-23, P-25, P-26, P-27, P-28 (summaries only), P-60 and P-65 as C3.186:P, $3.05/copy as C3.186:P-60/90.

Descriptors: *Census, *Population census, *Consumer income, United States, Family income, Tables(Data), Socioeconomic status.

The report provides information on the money income in 1972 of families and persons in the United States based on an inquiry on 1972 consumer income included in the March 1973 Current Population Survey. For Characteristics other than income, 1973 data are used. Text tables show data for total money income in 1972 for families compared with unrelated individuals and with 1952 income by specified characteristics for number of families, mean and aggregate income, and percent distribution of all families and those with $15,000 or more. Detailed data are also shown for 1972 income of families and unrelated individuals and persons 14 years old and over, and include data cross-classified by: type of residence; race; region; age; education; earnings and occupation; work experience; source of income; and type of income.

PB-232 503/3GA PC$6.25/MF$1.45
Florida Univ., Gainesville. Dept. of Food and Resource Economics.
ESTIMATION OF OUTDOOR RECREATIONAL VALUES,
Kenneth C. Gibbs, and John F. McGuire, III. Jul 73, 62p Economics-53 W74-08392, OWRR-B-007-FLA(11)
Contract DI-14-31-0001-3267

Descriptors: *Water resources, *Recreation, Recreation facilities, Travel, River basin development, Regional planning, Cost analysis, Mathematical models, Florida, Kissimmee River Basin.

A project was initiated at the University of Florida to estimate the value of water in alternative uses and to determine the optimum allocation among the alternative uses. Basically, the study was designed to develop and test two types of water allocation models: linear programming and simulation. In order to allocate water efficiently, values of alternative uses must be estimated. It is the purpose of this report to: (1) present the procedures used to derive estimates of economic value, and (2) derive the economic value of 'water oriented' outdoor recreation in the Kissimmee River Basin.

PB-232 705-T/GA PC$6.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C.
FINANCING OF HOUSING IN THE GERMAN FEDERAL REPUBLIC.
1971, 57p TT-71-55013
Trans. of mono. Le Financement du Logement dans la Republique Federale d'Allemagne, pub. by Federal Ministry of Town-Planning and Housing, Bonn (West Germany) Dec 70. Sponsored in part by the National Science Foundation, Washington, D.C.

Descriptors: *Housing studies, *West Germany, Construction, Housing projects, Financing, Town planning, Translations.

The report discusses the problems of housing construction financing and the economic and social incidences of methods applied in the public and private sector for obtaining financing funds. The future housing policy of the country is discussed with emphasis on the improvement of all environmental conditions and the integration of construction into town planning tasks.

PB-232 706-T/GA PC$8.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C.
THE FINANCING OF HOUSING IN FRANCE.
1970, 103p
Trans. of unidentified French language article.

Descriptors: *Housing studies, *France, Housing projects, Financing, Construction, Investments, Economic factors, Translations.

The report covers most of the aspects of the housing finance area in the country of France. The major subjects covered include the expenses for long-term financing of new housing, the methods by which public authorities intervene, the organization of the capital market, and private direct investment and various resources.

PB-232 707-T/GA PC$9.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C.
SOCIAL HOUSING POLICY IN BELGIUM.
1970, 125p TT-70-58184/3
Trans. of mono. La Politique Sociale du Logement en Belgique, pub. by Ministry of Public Health and Family Welfare, Housing and Family Welfare Administration, Brussels (Belgium), 1 May 60. Sponsored in part by National Science Foundation, Washington, D.C.

Descriptors: *Housing studies, *Belgium, Public housing, Low income groups, Middle income housing, Construction, Economic conditions, Slum clearance, Translations.

The report discusses the aspects of public housing with emphasis on encouraging low-income groups to buy houses, building more houses for middle income groups, instituting a national housing fund, fighting against slums.

PB-232 820/1GA PC$15.00/MF$1.45
Booz-Allen Public Administration Services, Inc., Washington, D.C.
COMPARATIVE ANALYSIS OF FEDERAL AND NON-FEDERAL GOVERNMENT HOUSING PROGRAM PROCEDURAL AND MANAGERIAL IMPLEMENTATION.
Final rept.
23 Jul 73, 237p HUD-PDR-004
Contract HUD-H-2087

Descriptors: *Housing planning, *Economic analysis, *Program review, Federal housing programs, State programs, Private financing programs, Mortage insurance, Loans, Management information systems, Management methods, Comparative studies.
Identifiers: *Housing and urban development research.

The primary purpose of the study was to compare processing times, procedures, and operations of housing programs administered by HUD to those administered by other Federal government agencies, state government agencies, private mortage insurers, and private lending institutions. The secondary purpose of this study was to identify ideas for procedural and managerial improvements in HUD housing. Major findings and conclusions are included in the report.

PB-232 916/7GA PC$10.00/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
TOWARD HOUSING GOALS FOR THE UNITED STATES: CONCEPTS, METHODS, AND MEASURES.
Final rept.,
David Birch, Reilly Atkinson, III, Phillip L. Clay, Richard P. Coleman, and Bernard J. Frieden. 15 Aug 73, 509p* HUD-PDR-120a
Prepared in cooperation with David Birch, Joint Center for Urban Studies, Cambridge, Mass.

Descriptors: *National housing goals, *Housing planning, Construction characteristics, Reviews, Evaluation, United States, Concepts, Shortages, Housing market, Substandard housing, Consumer preferences, Statistical analysis, Socioeconomic status, Urban areas, Rural areas, Problem solving, Methodology, Recommendations, Household characteristics.
Identifiers: *Housing and urban development research.

The report provides a critique of past attempts to define housing goals for the United States and offers improved estimates of new construction during the 1970's, housing deprivation as of 1970, patterns of consumer preferences likely to be significant during the 1970's, and the number of standard and substandard units in 1980. It suggests that a sole focus on a national production goal is inappropriate and that a mix of programs--aimed at the needs of households--which varies in size and composition from region to region is needed. This report also calls for a procedure to measure progress toward local goals along several dimensions.

PB-232 931/6GA PC$4.00/MF$1.45
TransCentury Corp., Washington, D.C.
FILTRATION AND BENEFICIARY SUBSIDIZED HOUSING DATA COLLECTION.
Final rept.
Jun 73, 19p HUD-PDR-201
Contract HUD-H-2079

Descriptors: *Housing studies, *Subsidy programs, *Surveys, Low income groups, Interviews, Research.
Identifiers: *Housing and urban development research.

Trans Century Corporation collected data from 2,673 domiciles and 49 project managers in three HUD Regions III, VI, and IX during a four week period of time from May 14 to June 9, 1973. The data were collected using three different survey instruments for two different studies, Filtration Study and Beneficiary Study. Filtration: Interviewing for this study began with 953 randomly selected recipients of 235, 236, and 236 Rent Supplement subsidized housing programs in the three HUD regions. Beneficiary: This study was completed in HUD Region IX comparing beneficiaries of subsidized housing with eligible persons who were not receiving subsidized housing. Data was collected from 297 residents of low income census tracts and 304 residents of subsidized housing.

PB-232 932/4GA PC$5.75/MF$1.45
Rutgers - The State Univ., New Brunswick, N.J. Center for Urban Policy Research.
REHABILITATION VERSUS REDEVELOPMENT: COST-BENEFIT ANALYSES.
Draft rept.,
David Listokin, and George Sternlieb. Jun 73, 204p* HUD-PDR-302

Descriptors: *Housing restoration, *Benefit cost analysis, *Redevelopment, Evaluation, Policies, Housing projects, Construction, Replacing, Cost estimates, Neighborhoods, Urban sprawl, Urban development.
Identifiers: *Housing and urban development research.

The objective of the study is to get at the 'facts' of rehabilitation's versus redevelopment's costs. It evaluates the costs and benefits of these strategies and then considers what is the optimal housing strategy, rehabilitation or redevelopment, given their relative costs-benefits.

6. BIOLOGICAL AND MEDICAL SCIENCES

PATENT-3 661 593 Not available NTIS
Department of Agriculture, Washington, D.C.
PROTEIN CONCENTRATES FROM BUFFER TREATED CEREAL ENDOSPERM PRODUCTS.
Patent, *Filed 24 Apr 70, patented 9 May 72,
Donald D. Christianson, Arthur C. Stringfellow, and Joseph S. Wall. 9 May 72, 6p PAT-APPL-31 542,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cereal products, *Food processing, *Patents, Proteins, Hydration, Separation, Potassium phosphates, Magnesium chlorides, Grains(Food).

Identifiers: PAT-CL-99-17, Food protein concentrates.

The invention is an improvement made in processes for preparing protein enriched products from cereal grains. Protein which envelopes starch particles in cereal endosperm is loosened by hydration in an aqueous buffer solution. Standard commercial procedures such as grinding, milling, air classification, or screening can be used to prepare the desired products.

6A. Biochemistry

AD-780 009/7GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
SOME EFFECTS OF DBCAMP ON RABBIT BONE MARROW CELLS IN CULTURE: CELL CLUMPING AND CHOLINESTERASE PRODUCTION.
Technical rept. Jul 72-Jul 73,
Vincent F. Garry, Jr., Larrel W. Harris, and John P. Petrali. Apr 74, 14p Rept no. EB-TR-74017

Descriptors: *Bone marrow, *Adenosine phosphates, *Cholinesterase, Biosynthesis, Nucleotides, Enzymes, Cells(Biology), Proteins, Membranes(Biology), Erythrocytes.
Identifiers: Cell physiology.

Bone marrow cells derived from phenylhydrazine-treated rabbits were grown in vitro for 24 hours. Marrow cultivated in the presence of .001 M dibutyryl 3',5'-cyclic monophosphate (DBcAMP) formed large, dense cell clusters whereas those from control cultures formed smaller, more discrete cell clusters. Actinomycin D inhibited cluster formation. Erythroid cell maturation was also inhibited in the presence of DBcAMP. However, cholinesterase synthesis was enhanced. Most of the cells containing newly synthesized membrane-bound cholinesterase are erythroid. On the basis of the data obtained, it is suggested that the cyclic nucleotide may stimulate membrane protein synthesis. (Author)

AD-780 080/8GA Reprint
Philadelphia General Hospital Pa Dept of Clinical Pathology
THE EFFECT OF HEMORRHAGIC SHOCK ON THE PHOSPHOLIPID COMPOSITION OF BLOOD PLASMA OF ANESTHETIZED DOGS (37747),
Henry P. Schwarz, Lorraine Dreisbach, and John J. Spitzer. 20 Jun 73, 6p
Contracts N00014-69-C-0154, N00014-72-A-0003
Sponsored in part by Contract N62269-71-C-0699.
Availability: Pub. in Proceedings of the Society for Experimental Biology and Medicine, v145 p57-61 1974.

Descriptors: *Hemorrhagic shock, *Phospholipids, Lipids, Blood chemistry, Blood plasma, Shock(Pathology), Anesthesia, Dogs, Experimental data.

The phospholipid composition of arterial, sagittal sinus and hepatic venous blood plasma was investigated in dogs under pentobarbital anesthesia both before and shortly after a severe hemorrhage. The total lipid P concentration in the artery decreased following hemorrhage, but the phosphatidylglycerol concentration increased. Only small and variable differences were observed across the splanchnic region either before or after the bleeding. A significant release of total lipid P, phosphatidyl ethanolamine, choline plasmalogen and phosphatidylglycerol was noted across the brain under control conditions. The individual phospholipids were continued to be released even following hemorrhage.

AD-780 149/1GA Reprint
Hahnemann Medical Coll and Hospital Philadelphia Pa Dept of Physiology and Biophysics
ENDOTOXIN-INDUCED ALTERATIONS IN ISOLATED FAT CELLS: EFFECT ON NOREPINEPHRINE-STIMULATED LIPOLYSIS AND CYCLIC 3',5'-ADENOSINE MONOPHOSPHATE ACCUMULATION (37774),
Judy A. Spitzer. 2 Jul 73, 8p
Sponsored in part by Office of Naval Research, Arlington, Va., and National Institutes of Health, Rockville, Md.
Availability: Pub. in Proceedings of the Society for Experimental Biology and Medicine, v145 p186-191 1974.

Descriptors: *Endotoxins, *Adipose tissue, Metabolism, Cells(Biology), Adenosine phosphates, Levarterenol, Lipids, Lipoproteins, Fatty acids, In vitro analysis.
Identifiers: *Norepinephrine.

The underlying alterations in energy demand and tissue fuel supply associated with various forms of injury and shock have been the subject of a great deal of research in recent years. In this context the adipose tissue mass assumes special importance, since it represents usually at least 15% of body weight and it is the major storehouse to satisfy energy requirements. In an attempt to elucidate the mechanism whereby endotoxin renders the fat cells more metabolically responsive to norepinephrine, the interaction between endotoxin and fat cells in vitro was investigated. The present communication reports the results of these in vitro studies.

AD-780 329/9GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Biological Sciences
DNA PRECURSORS AND THE ABSENCE OF THYMIDINE KINASE IN YEAST MITOCHONDRIA,
L. Zeman, and C. V. Lusena. 20 Dec 73, 5p NRC-13764
Availability: Pub. in FEBS Letters, v40 n1 p84-87 Mar 74.

Descriptors: *Deoxyribonucleic acids, *Mitochondria, Thymidines, Nucleic acids, Yeasts, Enzymes, Biosynthesis, Cells(Biology), Canada.
Identifiers: *Kinases(Phosphorylating)/thymidine.

The absence of dTK in cell extracts of yeast and other microorganisms has been reported. However, the bromodeoxyuridine resistant mammalian cells which also lack the cytoplasmic enzyme, still contain a mitochondrion-specific dTK. The authors therefore asked whether yeast mitochondria contains a specific dTK and whether precursors other than dXTP can be used for the in vitro labelling of the m-DNA. The results show that yeast mitochondria do not contain any detectable levels of dTK and that among thymine derivatives tested only dTDP or dTTP could be used as effective precursors for the in vitro labelling of M-DNA.

COO-1422-160 PC$4.75/MF$1.45
Wisconsin Univ., Madison (Usa). Bone Mineral Lab.
INTERNATIONAL CONFERENCE ON BONE MINERAL MEASUREMENT, OCTOBER 12--13, 1973, CHICAGO, ILLINOIS.
1973, 55p CONF-731036-(Absts.)

Descriptors: (*Bone tissues, *Minerals), Abstracts, Measuring methods, Meetings.

For abstract, see NSA 29 12, number 31630.

IEA-289 PC$4.25/MF$1.45
Instituto de Energia Atomica, Sao Paulo (Brazil).
RADIOIMMUNOASSAY OF INSULIN IN THE HUMAN PLASMA.
I. Torres de Toledo e Souza, O. Z. Higa, B. L. Wajchenberg, H. Pinto, and R. R. Pieroni. Apr 73, 21p
In Portuguese.

Descriptors: (*Insulin, *Radioimmunoassay), Blood serum, Man, Sampling.

For abstract, see NSA 29 12, number 29920.

PAT-APPL-423 303 PC$4.50/MF$1.45
Department of Health, Education, and Welfare. Bethesda, Md. Patent Branch.
HUMAN PARATHYROID HORMONE.
Patent Application,
H. B. Brewer. Filed 10 Dec 73, 29p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Paratyphoid hormone, Isolation, Amino acids, Chemical composition, Synthesis(Chemistry), Purification.
Identifiers: Amino acid sequences.

The patent application relates to the isolation and purification of human parathyroid hormone from human parathyroid adenomas. The primary sequence of the amino terminal 34 residues was determined and the peptide of the first 34 residues synthesized.

PB-232 549/6GA PC$6.75/MF$1.45
Hylands Labs., Costa Mesa, Calif.
USE OF POLYMERS IN THE FRACTIONATION OF PLASMA PROTEINS.
Annual rept. Jul 73-Mar 74,
Luis A. Garcia. Mar 74, 73p NIH/NHLI-N01-HL-2970(B)-1
Contract N01-HL-2970(B)

Descriptors: *Polyoxypropylene, *Blood plasma, *Blood proteins, Precipitation(Chemistry), Distillation, Purification, Polymers, Albumins, Globulines.
Identifiers: Fractionation, Blood coagulation factor VIII.

Several grades of polypropylene glycol (Pluronics) are effective protein precipitants. In preliminary investigations, Pluronic F-38 material has shown indications of being superior to other polymer systems employed to date in the preparation of such products as antihemophilic factor, a Factor IX Complex designated PROPLEX, and intravenous IgG. As a result, F-38 was selected as one of the precipitating agents in a privately supported feasibility study on the fractional precipitation of plasma -- although others of this generic type may find some limited employment.

PB-232 629/6GA PC$4.00/MF$1.45
National Bureau of Standards, Washington, D.C. Inst. for Materials Research.
INTERACTION OF PLASMA PROTEINS WITH SURFACES.
Annual rept. 1 Jul 72-30 Nov 73,
C. A. Fenstermaker, W. H. Grant, B. W. Morrissey, L. E. Smith, and R. R. Stromberg. 22 Mar 74, 85p NBSIR-74-470

Descriptors: *Blood plasma, *Blood proteins, *Surface chemistry, Surface energy, Adsorption, Blood coagulation, Surface properties, Mechanical organs, Implantation, Silicon dioxide.
Identifiers: Blood compatible materials, Biomaterials.

The interaction of blood proteins with surfaces has been investigated with principal attention focused on those proteins that are either major constituents of blood plasma or are implicated as being important in the clotting process. Emphasis has been placed on molecular conformational changes occurring upon the interaction of such proteins with surfaces. The extension of adsorbed molecules of fibrinogen, albumin, and prothrombin on a number of selected materials was studied by ellipsometry. The results indicate a dependence of conformation on surface energy. Measurements of the bound fraction of these adsorbed blood proteins on a silica surface showed that approximately ten percent of the carbonyl groups were attached to the surface for prothrombin and serum albumin at all values of surface populations for the solution concentrations studied.

PB-232 972/8GA PC$3.75/MF$1.45
Illinois Univ., Urbana. Water Resources Center.
INVESTIGATION OF THE CHEMICAL IDENTITY OF SOLUBLE ORGANOPHOSPHORUS COMPOUNDS FOUND IN NATURAL WATERS.
Research rept.,
Roger A. Minear, and Kenneth A. Walanski. May 74, 73p WRC-RR-86, UILU-WRC-74-0086 W74-08935, OWRR-A-060-ILL(1)
Contract DI-14-31-0001-3813

Descriptors: *Organic phosphates, *Algae, *Biosynthesis, Water analysis, Molecular weight, Cyclohexane compounds, Chromatographic analysis, Chlamydomonas, Chlorella, Cultures(Biology).
Identifiers: Gel chromatography, *Inositol phosphates, Anabaena.

The ability of various laboratory algal cultures to generate substantial quantities of dissolved organic phosphorus (DOP) compounds has been demonstrated. After isolation and concentration of these compounds by low pressure filtration, freeze drying and redissolution, molecular size profiles on Sephadex gels were obtained. Comparison between DOP and inositol phosphate profiles on Sephadex G-25 prompted specific studies for the presence of inositol phosphates in the culture solutions. Alkaline bromination techniques established in soil chemistry research were employed in conjunction with Sephadex gel filtration to generate circumstantial evidence for the presence of inositol monophosphate and the absence of inositol hexaphosphate. The results obtained in conjunction with preliminary volatile derivative studies have provided the base for continued studies on the specific chemical nature of DOP compounds in aqueous systems.

TT-73-54064 PC$3.00
Department of Agriculture, Washington, D.C.
INVESTIGATION OF GLYCOALKALOIDS ON A DROPPING ELECTRODE (BADANIE GLIKOALKALOIDOW NA ELEKTRODZIE KROPLOWEJ).
Tadeusz Pierzchalski. 1974, 19p
Trans. of Chemia Analityczna (Poland) v8 n443 p443-455 1963, by Krzysztof Radziwill. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Polarographic analysis, Surfactants, Electric current, Glycosides, Poland, Translations.
Identifiers: *Glycoalkaloids.

The report concerns the polarographic behavior of glycoalkaloids. As a result of adsorption on the dropping electrode the glycoalkaloids suppress polarographic maxima, produce distortion of the limiting currents of more than univalent depolarizers, and exert a catalytic effect on the reduction of hydrogen ions. From the experiments carried out it follows that glycoalkaloids can be determined qualitatively and quantitatively by polarographic methods. Since in a certain range of concentrations glycoalkaloids form complex combinations with the cupric ion, it will be possible to develop a new method of isolating glycoalkaloids from the plant material.

6B. Bioengineering

AD-780 307/5GA Reprint
School of Aerospace Medicine Brooks AFB Tex
A NONDESTRUCTIVE ULTRASONIC TECHNIQUE TO MEASURE DIAMETER AND BLOOD FLOW IN ARTERIES,
Robert M. Olson, and Julian P. Cooke. 28 Nov 72, 5p
Revision of report dated 14 Aug 72.
Availability: Pub. in IEEE Transactions on Biomedical Engineering, v-BME-21 n2 p168-171 Mar 74.

Descriptors: *Blood flow, *Arteries, *Bioinstrumentation, Probes, Ultrasonic tests, Nondestructive testing, Diameter, Dogs, Laboratory animals, Biomedicine, Monitoring, Doppler effect.

A nondestructive technique to continuously monitor diameter and blood flow at the same point along the descending thoracic aorta has been developed. A probe was passed down the esophagus to a level 1 to 2 cm distal to the aortic arch. On its distal end were Doppler-shift velocity-detecting and pulse-echo position-sensing crystals. The pulse-echo system was used not only to measure the diameter of the aorta, but also to aim all of the probe crystals directly across the axis of the aorta. Information supplied by this system aided in the identification of the aorta and helped to avoid measurement artifacts such as the inclusion of other arteries, veins, or moving structures. (Modified author abstract)

AD-780 451/1GA PC$3.25/MF$1.45
Polytechnic Inst of New York Brooklyn Dept of Aerospace Engineering and Applied Mechanics
LASER DIAGNOSTIC TECHNIQUES AT POLYTECHNIC INSTITUTE OF NEW YORK AEROSPACE FACILITIES.
Interim rept.,
S. Lederman, M. H. Bloom, J. Bornstein, and P. K. Khosla. May 74, 31p Rept no. PINY-AE/AM-74-8
Contracts N00014-67-A-0226-0005, DAHC04-69-C-0077

Descriptors: *Lasers, *Diagnostic equipment, Raman spectroscopy, Temperature, Measurement.
Identifiers: Laser doppler anemometers.

A short discussion of some conventional diagnostic techniques, followed by a discussion of the Raman effect and the laser Doppler anemometer, is given. The apparatus used at PINY and the techniques developed utilizing the Raman effect are described. Some experimental results concerning concentrations of mixtures and temperature measurements in flames are presented and discussed. (Author)

PATENT-3 476 670 Not available NTIS
Department of Agriculture, Washington, D.C.
POLAROGRAPHIC ELECTRODE STRUCTURE.
Patent, *Filed 10 Apr 67, patented 4 Nov 69,
Bernard A. Weiner. 4 Nov 69, 3p PAT-APPL-643 773,
Previously filed as PAT-APPL-388 731, 10 Aug 64.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polarography, Oxygen, Measuring instruments, Biology.
Identifiers: PAT-CL-204-195.

The invention relates to improved components of polarographic systems for continuously measuring the content of dissolved oxygen, e.g. in the hemolymph of undesirable insects or in fermentation media. In another aspect this invention relates to highly improved elements that cooperate to permit repetitive and self-sterilizing insertions of a protected polarographic cathode through a disinfectant-containing symmetrically-cored rubber stopper that is relatively permanently fixed in the sidewall of an oxygen-receiving bath-heated fermentation flask.

PATENT-3 807 387 Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
TESTING METHOD AND APPARATUS FOR THE CONFIRMATION OF MONITORED ELECTROCEREBRAL SILENCE.
Patent,
Edward F. MacNichol, Jr. Filed 10 Apr 72, patented 30 Apr 74, 6p PAT-APPL-242 301,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Monitors, *Electroencephalography, Death, Verifying, Head(Anatomy), Patients, Tests, Cerebrovascular disorders, Bioinstrumentation.
Identifiers: PAT-CL-128-2-1-B.

The invention discusses a testing method and apparatus for accurately confirming a monitored condition indicative of electrocerebral silence while the cortical activity of a patient is being recorded by an electroencephalograph device of the type comprising a plurality of electrodes and associated leads disposed in contact with the patient's head and coupled through various amplification channels to a recording and read-out mechanism.

6C. Biology

AD-779 920/8GA PC$3.75/MF$1.45
School of Aerospace Medicine Brooks AFB Tex
SELECTED TOPICS IN LABORATORY ANIMAL MEDICINE. VOLUME XIV. ZOONOSES OF PRIMATES.
Aeromedical review,
George W. Irving, III. May 74, 75p* Rept nos. SAM-Review-2-74, SAM-TR-74-4
See also Volume 13, AD-760 112.

Descriptors: *Primates, *Veterinary medicine, Laboratory animals, Infectious diseases, Parasitic diseases, Virus diseases, Protozoa, Bacteria, Fungi, Disease vectors, Humans, Public health.
Identifiers: *Zoonoses, Animal diseases.

The review discusses the classification, etiology, public health significance, and preventive measures for the major zoonoses of the nonhuman primates usually housed in the animal colony. (Author)

AD-780 136/8GA Reprint
Armed Forces Inst of Pathology Washington D C
CORRELATION OF THE FLUORESCENT BANDING PATTERN AND ULTRASTRUCTURE OF A HUMAN CHROMOSOME,
H. M. Golomb, and G. F. Bahr. 28 Sep 73, 7p
Revision of report dated 21 May 73.
Availability: Pub. in Experimental Cell Research, v84 p121-126 1974.

Descriptors: *Chromosomes, Electron microscopy, Morphology(Biology), Cells(Biology), Humans, Fluorescence.

Human chromosomes have been analysed for their fluorescent banding pattern (Q-bands) after spreading in a trough. The chromosomes were then critical-point dried and viewed in the electron microscope. The fluorescent bands of one typical chromosome are compared with the structural and quantitative properties of the chromosome as revealed by electron microscopy. The fluorescence distribution parallels the mass distribution along the chromatids. (Author)

AD-780 142/6GA Reprint
Armed Forces Inst of Pathology Washington D C
HUMAN CHROMATIN FROM INTERPHASE TO METAPHASE - A SCANNING ELECTRON MICROSCOPIC STUDY,
H. M. Golomb, and G. F. Bahr. 28 Sep 73, 10p
Revision of report dated 25 May 73.
Availability. Pub. in Experimental Cell Research, v84 p79-87 1974.

Descriptors: *Chromosomes, *Cytology, *Mitosis, Cell division, Cells(Biology), Physiology, Electron microscopy.
Identifiers: *Chromatin.

Scanning electron microscopy (SEM) was used to observe surface-spread, critical-point-dried

human interphase nuclei and chromosomes from cultures of peripheral lymphocytes arrested with colchicine. The following points have been documented. Randomly packed interphase chromatin begins to aggregate into prophasic chromosomes that contain accumulations of chromatin at complementary positions along each chromatid. As prophase merges into metaphase in vitro, the chromomeres become less distinct, and eventually a classic, condensed chromosome with only tortuous, looping fibers is observed. Chromosomes not treated with arresting soluting also maintain interchromosomal fibers. DNase studies reveal distinct chromomeres at complementary loci in each chromatid. Interphase nuclei on the same grid show only few, parallel fibers and no chromomeres.

AD-780 154/1GA Reprint
Naval Medical Research Unit No 4 Great Lakes Ill
TOXICITY IN HELA CELLS MEDIATED BY PLASTIC WRAPS,
Bonnie M. Bando, and Max J. Rosenbaum. 1972, 2p
Summaries in French and German.
Availability: Pub. in Laboratory Practice, 2p Jan 73.

Descriptors: *Tissue culture cells, *Plastics, *Toxicity, Cells(Biology).
Identifiers: Packaging materials.

Cytoxicity observed in tubed HeLa cell cultures was shown to be related to the use of a particular brand of plastic wrap employed in the 'sandwich' technique for sealing tissue culture tubes. Two additional methods were devised to expose HeLa cell cultures to four brands of plastic wrap including 'Saran Wrap,' 'Vitafilm,' 'Handi-Wrap,' and 'Glad Wrap.' In all tests undertaken, 'Vitafilm' was shown to produce the most toxicity. (Author)

AD-780 197/8GA PC$4.50/MF$1.45
Princeton Univ N J Dept of Statistics
A DISCUSSION OF SIMULATION RESULTS FOR VARIOUS ASPECTS OF THE NEUTRAL ALLELES MODEL.
Technical rept.,
K. Kirby. Apr 74, 26p Rept no. TR-59-Ser-2
Contract N00014-67-A-0151-0017

Descriptors: *Sampling, *Genetics, Distribution functions, Probability, Estimates, Tables(Data).
Identifiers: *Alleles.

In the paper a number of simulation results relating to the theory of neutral alleles are discussed. In particular, results derived from the distribution of Karlin, McGregor, and Ewens for the number and configuration of alleles in a sample of genes from a selectively neutral locus are considered. The problems discussed concern efficiencies of estimation, an approximation to the distribution of a test-statistic for neutrality, and the effect of changes in population size on an index of neutrality. (Author)

AD-780 217/6GA PC$3.00/MF$1.45
Naval Undersea Center San Diego Calif
RADIOGRAPHIC ATLAS OF THE CALIFORNIA SEA LION.
Research and Development rept. Jun 72-Jun 73,
John C. Sweeney. Apr 74, 19p Rept no. NUC-TP-387

Descriptors: *Seals(Mammals), *Radiography, Diagnostic equipment, Aquatic animals, Carnivora, Anatomy.
Identifiers: *Sea lions, Atlases.

A radiographic reference atlas of the California sea lion complete with an evaluation of techniques for all of the standard positions was developed. Photographs and drawings of the normal radiographic anatomy are presented. The radiographic technique has been one of the most useful diagnostic aids available to the clinician. It is particularly valuable for use with the California sea lion because of the limited availability of diagnostic techniques practically applicable to this species. The satisfactory radiographic examination is facilitated by standardized techniques and by an awareness on the part of the observer of anatomic peculiarities of the sea lion. It is the intention of this brief atlas to provide technical data and useful illustrations as an aid to a meaningful examination.

AD-780 256/4GA PC$7.00/MF$1.45
Edaw Inc San Francisco Calif
WILDLIFE DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 80p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 257.

Descriptors: *Wildlife, *Texas, Global communication systems, Extremely low frequency, Sites, Mammals, Fishes, Birds, Reptiles, Distribution, Protection, Amphibians, Recreation, Habitability, Abundance.
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles westnorthwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 264/8GA PC$9.75/MF$1.45
Edaw Inc San Francisco Calif
VEGETATION DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 133p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 248.

Descriptors: *Plants(Botany), *Land areas, *Michigan, Global communication systems, Extremely low frequency, Sites, Vegetation, Classification, Trees, Swamps, Grasses, Shrubs, Ecology, Patterns, Distribution, Terrain.
Identifiers: *Sanguine project, Hardwoods, Conifers.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 279/6GA PC$9.75/MF$1.45
Edaw Inc San Francisco Calif
VEGETATION DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 133p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 280.

Descriptors: *Plants(Botany), *Land areas, *Texas, Global communication systems, Extremely low frequency, Sites, Vegetation, Trees, Grasses, Shrubs, Ecology, Patterns, Distribution, Terrain.
Identifiers: *Sanguine project, Plant associations.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles westnorthwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 293/7GA PC$6.50/MF$1.45
Edaw Inc San Francisco Calif
WILDLIFE DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 67p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 294.

Descriptors: *Wildlife, *Michigan, Global communication systems, Extremely low frequency, Sites, Mammals, Fishes, Birds, Reptiles, Distribution, Protection, Amphibians, Swamps, Reclamation, Recreation, Habitability.
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

COM-74-11081/8GA PC$4.75/MF$1.45
New Mexico Dept. of Game and Fish, Santa Fe.
VERTICAL RACEWAYS AND WATER RE-USE AS A MEANS OF MAXIMIZING COMMERCIAL TROUT PRODUCTION.
Final rept. 1 Jun 71-31 May 73,
Richard N. McCleskey, and Warren J. McNall. 26 Mar 74, 31p NOAA-74051404

Descriptors: *Trout, *Aquaculture, *Water treatment, Silos, Commercial fisheries, Animal nutrition, Filtration, Efficiency, Fish raceways, New Mexico.
Identifiers: Water reuse.

Data indicate that trout production in silos will compare very favorably with conventional pond and raceway systems. The food conversion, percent gain per day, and mortalities were well within acceptable limits. An 84% reduction in personnel time was realized as the result of silo use for trout propagation. This savings occurred primarily because the silos are self-cleaning. The tested water treatment system included a biological filter for ammonia reduction and a sand filter for suspended solids removal. The system satisfactorily treated the effluent water; however, it appears that suspended solids are the primary metabolic product that has to be reduced for vertical raceway water reuse. Ammonia and dissolved oxygen remained within acceptable limits during two water uses. (Modified author abstract)

COM-74-11082/6GA PC$4.00/MF$1.45
Texas Parks and Wildlife Dept., Austin.
COMMERCIAL FISHERIES LANDINGS STATISTICAL PROGRAM - STUDY NO. 2.
Completion rept. 1 Mar 71-28 Feb 74,
Claude L. Hamilton. Apr 74, 6p NOAA-74051402

Descriptors: *Commercial fisheries, *Texas, Seafood, Prices, Statistical data, Fishes, Crabs, Oysters, Shrimps, Trout, Data processing.
Identifiers: Catch statistics.

Commercial fishery statistical landings were collected from seafood dealers with the program improving in content, accuracy and report expediency with the use of automatic data processing. The

use of interchangeable punch cards and new reporting forms reduced overall processing time allowing the two statistical agents more time in the field contacting retail and wholesale seafood dealers, commercial fishermen, crabbers, oystermen, transient and out-of-state commercial fishermen thereby insuring more complete and accurate reporting of Texas landings. The program was closely coordinated with field agents and staff of the Division of Statistics and Market News, National Marine Fisheries Service.

COM-74-11086/7GA Reprint
Colorado Cooperative Fishery Unit, Fort Collins.
INVESTIGATION OF POND SPAWNING METHODS FOR FATHEAD MINNOWS,
Stephen A. Flickinger. 1972, 18p NOAA-74041718
Pub. in Proceedings of the Annual Conference of the Southeastern Association of Game and Fish Commissioners (26th), p376-391 1972.

Descriptors: *Minnows, *Aquaculture, Fish ponds, Mortality, Reproduction(Biology), Survival.
Identifiers: Pimephales promelas, Bait fish.

For transfer of fingerling fathead minnows (Pimephales promelas) from spawning ponds to growing ponds, the optimum combination of brood-fish population density and sex ratio in the spawning pond was 19,200 fish per surface acre and five females to one male. Fingerling production from this combination amounted to 1,524,500 fish. Fathead minnows used spawning boards placed up to five ft deep, and they also used boards placed without reference to the substrate. Larger nest sites encouraged larger egg deposits. Nests were crowded together as effectively by restricting available nest sites as by providing visual isolation or territorial markings. Post-spawning mortality of adults ranged from 20% to 91% with higher survival of females than males.

COM-74-11087/5GA PC$6.25/MF$1.45
Arkansas Univ., Fayetteville. Dept. of Zoology.
EFFECTS OF QUALITY AND QUANTITY OF FOOD ON GOLDEN SHINER, 'NOTEMIGONUS CRYSOLEUCAS', PRODUCTION. PART 1. EFFECTS OF QUANTITY OF FOOD AND STOCKING DENSITIES ON GROWTH, PRODUCTION AND TEMPERATURE TOLERANCE OF GOLDEN SHIN ERS ('NOTEMIGONUS CRYSOLEUCAS').
Final rept.,
Raj V. Kilambi, and Gary D. Hickman. 1973, 64p NOAA-74051605

Descriptors: *Fishes, *Aquaculture, Feeding habits, Growth, Tolerances(Physiology), Temperature, Abundance, Commercial fisheries.
Identifiers: Notemigonus crysoleucas, Bait fish.

It was determined that the best feeding rate and population density appear to be 5% feed at a stocking rate of 400 lbs. per acre for Golden Shiner production. At the end of six months the golden shiners were subjected to a series of temperature tolerance tests to determine if the amount of food or the population density affected the tolerance of the fish. The fish were subjected to both slowly changing temperatures and sudden temperature changes. In general, the total lower lethal temperature was about the same for all conditions. The total upper lethal temperature of golden shiners exposed to a sudden rise in temperature was about the same for all conditions. The tolerance of golden shiners to gradual changes in temperature did vary with different conditions. (Modified author abstract)

COM-74-11088/3GA PC$5.00/MF$1.45
Kentucky Dept. of Fish and Wildlife Resources, Frankfort.
COMMERCIAL FISHERY INVESTIGATIONS OF NOLIN AND ROUGH RIVER RESERVOIRS, KENTUCKY.
Rept. for 1 Jan 72-15 Jan 74,
Robert D. Hoyt, and Rory B. Flynn. Jan 74, 37p NOAA-74051403

Descriptors: *Commercial fisheries, *Fish economics, *Kentucky, Reservoirs, Fishing, Statistical data, Catfishes, Fresh water fishes, Carps, Bass, Nolin River, Rough River.

The commercial fishery of Nolin and Rough River Reservoirs, Kentucky was studied from January 1, 1972, to January 15, 1974. The number of fishermen working there decreased from 1972 to 1973. Two fishermen on Rough River were classed as regular or full-time fishermen in 1972. All other licensees in 1972 and all fishermen in 1973 were classed as part-time or occasional fishermen. The flathead catfish was the major species taken on both reservoirs. The smallmouth buffalo was common in Rough River, but completely absent in Nolin. Nolin Reservoir provided a greater commerical catch than Rough River Lake. The total value of all commercial species sold from both reservoirs was approximately $6000 in 1972 and $7500 in 1973. (Modified author abstract)

COM-74-11093/3GA Reprint
Wisconsin Univ., Madison. Sea Grant Program.
OLFACTORY ELECTROENCEPHALOGRAPHIC RESPONSES OF HOMING COHO SALMON, 'CONCORHYNCHUS KISUTCH', TO WATER CONDITONED BY CONSPECIFICS,
Andrew E. Dizon, Ross M. Horrall, and Arthur D. Hasler. 1973, 6p Wis-SG-74-343 NOAA-74051604
Grant NSF-GB-7616
Pub. in Fishery Bulletin, v71 n3 p893-896 1973.

Descriptors: *Salmon, *Animal behavior, *Animal navigation, *Smell, Odors, Animal migrations, Reproduction(Biology), Rivers, Olfactory organs, Electroencephalography, Sea Grant program.

An investigation of lake-run coho salmon, Oncorhynchus kisutch, was made to determine whether these fish exhibited specific olfactory bulb responses to home water. Tested were, salmon from two different home streams to examine responses to waters both on and off the migration routes. Responses to conditioned home-stream water were separated from responses to 'pure' home-stream water. Conditioning of water by conspecifics appeared to double the EEG response to the home stream. Perception of nonspecific odoriferous products is indicated since responses to water from the home stream and nonhome river by Ahnapee fish differ little, and Kewaunee fish responded to more to 'pure' water from the Ahnapee tributary than to their own homestream water.

COM-74-11101/4GA PC$7.25/MF$1.45
Alaska Dept. of Fish and Game, Juneau.
BRISTOL BAY TEST FISHING PROGRAM.
Completion rept. 1 Jul 70-30 Jun 73,
Robert D. Paulus. Dec 73, 84p NOAA-74042905
Report on Anadromous Fish Project.

Descriptors: *Fishing grounds, *Salmon, *Bristol Bay, Commercial fisheries, Age, Animal migrations, Statistical data, Fishing, Alaska.

Offshore test fishing in Bristol Bay originated in 1939 when U.S. vessels fished gillnet and seines between Cape Semiavin and Cape Newenham at the entrance to Bristol Bay to determine if the fish being caught there by the Japanese were of Bristol Bay origin. They found most sockeyes from 30 to 60 miles offshore and described them as Bristol Bay fish. Alaska Department of Fish and Game recreated the program in 1967, using matching Federal funds, on a line between Port Moller and Cape Newenham. Stations were set 5 miles apart from 28 to 78 miles from Port Moller, with every station fished with 200 fathoms of gillnet for 1 hour every 2 days. Catches were nearly identical to inshore runs in age composition, and gave a fair basis for estimating run magnitude and timing to the Bay. (Modified author abstract)

COM-74-11113/9GA PC$4.00/MF$1.45
North Carolina State Univ., Raleigh.
SOME ASPECTS OF INTERNATIONAL FISHERY LAW.
Sea Grant Pub.,
Seymour W. Wurfel. Mar 74, 97p* UNC-SG-74-01
NOAA-74051406
Grant NOAA-043-158-40

Descriptors: *Fisheries, *International law, Treaties, Marine resources, Conservation, Regulations, Law enforcement, Cod, Policies, Whales, Cetacea.
Identifiers: Sea Grant program.

Contents:
- Problems concerning the establishment of exclusive fishery rights;
- The fisheries dilemma--unilateral action supporting the right to ocean resources;
- United States participation in the treaty regulation of fishery conservation;
- The problems of enforcement of United States fishery laws and treaties;
- Japanese-American efforts to conserve living marine resources;
- The private fishery agreements between the People's Republic of China and Japan;
- The cod war:
- Iceland, England, and the International Court of Justice;
- Norwegian fisheries policy--the EEC membership negotiations and after;
- International law and the conservation of whales.

COM-74-50189-03/GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Washington, D.C.
MARINE FISHERIES REVIEW. VOLUME 36, NUMBER 3, MARCH 1974.
Monthly repts.,
Thomas A. Manar. Mar 74, 58p NOAA-74041711
Paper copy available from GPO $12.50/year as C55.310:36, $1.25/copy as C55.310:36/3.

Descriptors: *Fisheries research, Fishing industry, Recreation, Economic development, Food processing, Fish protein concentrates, Fish economics, Fish meal, Fish marketing, Reviews.

In addition to its regular informative sections, this issue contains the following articles: Publications and services of the National Marine Fisheries Service; Participation by Panamanian and U.S. Seiners in 1972 tuna fishery of the Eastern Tropical Atlantic; Diversification means progress in the Gloucester fishing industry; Marine recreational fishing in Alaska; Composition of the edible portion of raw (fresh or frozen) crustaceans, finfish, and mollusks; Fish meal--international market situation and the future.

COM-74-50189-03-01/GA
(Order as COM-74-50189-03)
National Marine Fisheries Service, Washington, D.C.
PUBLICATIONS AND SERVICE OF THE NATIONAL MARINE FISHERIES SERVICE.
J. David Almand. Mar 74, 9p MFR-Paper-1039
NOAA-74041711-1
Included in Marine Fisheries Review, v36, n3 p1-9 Mar 74, COM-74-50189-03.

Descriptors: *Fisheries, *Marine resources, Indexes(Documentation), Management, Aquaculture, Food processing, Conservation, Periodicals.

Forty-five categories of publications of the National Marine Fisheries Service are identified and characterized, and an overview of the major services is presented. The basic mission of NMFS is to protect and to promote the wise and full utilization of marine fisheries resources. NMFS thus concerns itself with many aspects of the fisheries, ranging from resource assessment and management to the ultimate use by consumers. In carrying out this mission, NMFS is guided by the following

goals: Promote economic, safe, and full utilization of selected commercial and sport fish resources; effectively conserve and allocate fisheries resources of interest to the United States; increase U.S. fish production through hatcheries and aquaculture; insure conservation of fisheries resources in manmade environmental alterations; and protect and conserve marine mammals.

COM-74-50189-03-02/GA (Order as COM-74-50189-03)
National Marine Fisheries Service, La Jolla, Calif. Southwest Fisheries Center.
PARTICIPATION BY PANAMANIAN AND U.S. SEINERS IN 1972 TUNA FISHERY OF THE EASTERN TROPICAL ATLANTIC,
Gary T. Sakagawa. Mar 74, 5p MFR-Paper-1040 NOAA-74041711-2
Included in Marine Fisheries Review, v36 n3 p10-13 Mar 74, COM-74-50189-03.

Descriptors: *Tunas, *Atlantic Ocean, Statistical data, Fishing grounds, Commercial fisheries.
Identifiers: Thunnas albacares, Katsuwonus pelamis.

American participation in the 1972 eastern tropical Atlantic tuna fishery is reviewed. For the American fleet (Panamanian and U.S. seiners) the 1972 season was successful in terms of total catch of 24,200 metric tons of tuna, second highest recorded (highest was the 1969 catch of 24,300 metric tons) since significant numbers of American vessels first participated in the fishery in 1967. Catches, catch rates, fishing areas, and sizes of yellowfin and skipjack tunas caught by the American fleet in 1972 are discussed.

COM-74-50189-03-03/GA (Order as COM-74-50189-03)
National Marine Fisheries Service, Gloucester, Mass. Northeast Region.
DIVERSIFICATION MEANS PROGRESS IN THE GLOCESTER FISHING INDUSTRY,
Jon C. Rittgers. Mar 74, 5p MFR-Paper-1041 NOAA-74041711-3
Included in Marine Fisheries Review, v36 n3 p14-17 Mar 74, COM-74-50189-03.

Descriptors: *Commercial fisheries, *Fish economics, *Massachusetts, Seafood, Frozen foods, Prices, Supply(Economics), Operating costs.
Identifiers: Gloucester(Massachusetts).

In celebrating the city's 350th anniversary in 1973, the people of Gloucester, MA., honored one of the nation's oldest industries, the commercial fishing industry. Its importance to the economy of Gloucester has been recognized in the past, but is now being jeopardized by a decline in the availability of traditional fish resources and increases in operating costs. Diversification has taken the form of changes in the species composition of the catch and the increased utilization of imported raw fish to supply a large new price-conscious and convenience-minded market for prepared frozen fish products. Information is given on landings, fish processing, various frozen fish preparation, employment and earnings of those in the industry.

COM-74-50189-03-04/GA (Order as COM-74-50189-03)
National Marine Fisheries Service, Juneau, Alaska. Alaska Region.
MARINE RECREATIONAL FISHING IN ALASKA.
Mar 74, 4p MFR-Paper-1042 NOAA-74041711-4
Included in Marine Fisheries Review, v36 n3 p18-20 Mar 74, COM-74-50189-03.

Descriptors: *Fisheries, *Recreation, *Alaska, Bays, Estuaries, Salmon, Trout, Cod, Licenses.
Identifiers: Sport fishing.

The National Marine Fisheries Service's role in developing Alaska's marine recreational fisheries will center on (1) providing active support to the state of Alaska for the collection, compilation, and publication of marine sport fish creel census data; (2) continuing the development and improvement of enhancement measures using gravel incubators, saltwater rearing pens, virgin lakes for rearing coho and chinook fry; (3) conducting an informational and educational program directed toward developing public interest in recreational fishing for rockfish, soles, and cods presently regarded as scrap fish; (4) supporting an economic study of the impact of marine recreational fishing on Alaskan communities; and (5) working with the state of Alaska through the State/Federal Program to develop management programs providing fair allocation of catches between users.

COM-74-50189-03-05/GA (Order as COM-74-50189-03)
National Marine Fisheries Service, College Park, Md. Fishery Products Technology Lab.
COMPOSITION OF THE EDIBLE PORTION OF RAW (FRESH OR FROZEN) CRUSTACEANS, FINFISH, AND MOLLUSKS. I. PROTEIN, FAT, MOISTURE, ASH, CARBOHYDRATE, ENERGY VALUE, AND CHOLESTEROL,
Virginia D. Sidwell, Pauline R. Foncannon, Nancy S. Moore, and James C. Bonnet. Mar 74, 16p MFR-Paper-1043 NOAA-74041711-5
Included in Marine Fisheries Review, v36 n3 p21-35 Mar 74, COM-74-50189-03.

Descriptors: *Fishes, *Nutritive value, *Crustacea, *Mollusca, Proteins, Fat analysis, Moisture, Ash content, Carbohydrates, Cholesterol.

The report summarizes the data on protein, fat, moisture, ash, carbohydrate, energy (calories) and cholesterol from 155 reference on 154 commonly eaten fish flesh. The primary objectives are: (1) To develop a comprehensive data bank on the chemical and nutritional composition of fish and fishery products; (2) to publish, as completely as possible, information on the nutrients found in fishery products; and (3) to point out areas in the chemical composition of fish needing further investigations.

ORNL-EIS-74-67 PC$6.75/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
FISH PROTECTION AT INTAKE STRUCTURES AND DAMS: GUIDANCE, SCREENS AND COLLECTION DEVICES. A SELECTED BIBLIOGRAPHY WITH ABSTRACTS.
E. E. Huber. Mar 74, 74p
Contract W-7405-eng-26

Descriptors: (*Fishes, *Safety), Bibliographies, Cooling, Dams, Inland waterways, Irrigation, Mechanical structures, Power plants, Surface waters.

For abstract, see NSA 29 12, number 29400.

ORNL-4412 PC$17.75/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
BIOLOGY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1968.
Jul 69, 293p
Contract W-7405-eng-26

Descriptors: (*Biology, *Research programs), Bacteria, Biochemistry, Biophysics, Enzymes, Genetics, Hematology, Immunology, Microorganisms, Oral, Photosynthesis, Physiology, Radiation protection, Radiobiology.

For abstract, see NSA 29 12, number 29656.

ORNL-4535 PC$13.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
BIOLOGY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING DECEMBER 31, 1969.
Jun 70, 196p
Contract W-7405-eng-26

Descriptors: (*Biology, *Research programs), Bacteria, Biochemistry, Biophysics, Enzymes, Genetics, Hematology, Immunology, Microorganisms, Oral, Photosynthesis, Physiology, Radiation protection, Radiobiology.

For abstract, see NSA 29 12, number 29657.

ORO-4023-5 PC$16.25/MF$1.45
Texas Univ., Austin (Usa). Dept. Of Zoology.
STUDIES OF DROSOPHILA DISPERSAL AND MIGRATION BY NEUTRON ACTIVATION AND GENETIC TECHNIQUES. PROGRESS REPORT.
R. H. Richardson. 1 Apr 74, 263p
Contract AT(40-1)-4023

Descriptors: (*Drosophila, *Population dynamics), Environment, Genetic variability, Genetics, Terrestrial ecosystems, Tracer techniques.

For abstract, see NSA 29 12, number 29922.

PATENT-3 352 762 Not available NTIS
Department of Agriculture, Washington, D.C.
DISINFECTANT-CONTAINING STOPPER FOR PROLONGED AEROBIC FERMENTATIONS.
Patent, *Filed 10 Aug 64, patented 14 Nov 67, Bernard A. Weiner. 14 Nov 67, 3p PAT-APPL-388 731,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Cocks, Fermentation, Contamination, Inhibition.
Identifiers: PAT-CL-195-127.

The invention concerns a contamination-inhibiting puncturable stopper, through which a needle electrode may be repeatedly inserted into a fermentation vessel.

PB-232 689/0GA MF$1.45
National Research Council, Washington, D.C. Committee on Animal Health.
AQUATIC ANIMAL HEALTH.
Nov 73, 53p* ISBN-0-309-02142-1
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418 $3.00.

Descriptors: *Fish diseases, *Fisheries, Frsh water fishes, Marine fishes, Shellfish, Aquaculture, Ecology, Proteins, Food, Disease vectors, Parasitic diseases, Viral diseases, Pollution, Law(Jurisprudence), Education.

The report evaluates the problems encountered in maintaining the health of aquatic species. It reviews certain aspects of the status and future potential of aquatic animals in meeting man's food and protein needs. Then it examines aquatic animal health and disease, identifying environmental and other man-made stresses that contribute to disease and kills in aquatic species. Its recommendations suggest research and educational programs to improve the nation's capabilities for dealing with aquatic-animal helath problems.

TT-71-51026 PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.
BIOLOGICAL METHOD OF CONTROLLING PLANT DISEASES (BIOLOGICHESKII METOD BORBY S BOLEZNYAMI RASTENII),
N. S. Fedorinchik. 1973, 19p
Trans. of Vsesoyuznyi Institut Zashchity Rastenii. Trudy (USSR) n23 p201-210 1964. Sponsored in part by National Science Foundation, Washington D.C. Special Foreign Currency Science Information Program.

Descriptors: *Plant diseases, *USSR, Biology, Control, Microorganisms, Soils, Fungi, Bacteria, Protozoa, Translations.

The translation reviews different biological control methods for plant diseases. Experiments were performed using microorganisms (fungi viruses, bacteria, protozoa) as active antagonists in the soils to control various plant diseases. Seed treatment methods and fertilizers are also discussed.

TT-71-51027 PC$3.25/MF$1.45
Department of Agriculture, Washington, D.C.
PECULIARITIES IN THE FORMATION OF 'PHASEOLUS L.' SPECIES IN THE OLD AND THE NEW WORLD (OSOBENNOSTI FORMOOBRAZOVANIYA VIDOV 'FASOLI L.' STAROGO I NOVOGO SVETA),
N. R. Ivanov. 1973, 26p
Trans. of Trudy po Prikladnoi Botanike, Genetike i Selektsii. Seriya A: Sotsialisticheskoe Rastenievodstvo (USSR) v2 n19 p185-208 1928. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Bean plants, *USSR, Classifications, Morphology, Translations.
Identifiers: Phaseolus vulgaris.

The genus Phaseolus numbering up to 170 species is represented by wild as well as cultivated species in the Old and New Worlds. The cultivated species of the genus Phaseolus L. possess great polymorphism. There are known to be over 500 races for the common Phaseolus vulgaris (L.) Savi alone. The report discusses the Asian Phaseolus species; division of genus; color of seeds; size; pods; diseases; flowers; and leaf characteristics.

TT-71-53128 PC$3.25/MF$1.45
Smithsonian Institution, Washington, D.C.
BRANCHING AND TILLERING IN THE POACAE FAMILY,
T. I. Serabriakova. 1974, 45p
Trans. of mono. Vetvlenie i Kutsenie v Semeistve Poaceae, n.p., n.d., by Geti Saad. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Grasses, Evolution(Development), Plants(Botany), Taxonomy, Ecology, Translations, USSR.
Identifiers: Poaceae.

The diversity of modes of branching in different taxonomic and ecological groups of grasses is described and its three aspects are considered: the position of the lateral shoot with respect to the protecting leaf (extra - and intravaginal branching); the distribution of the lateral shoots on the main shoot (dispersed and condensed branching or tillering); the time of initiation of the lateral shoots on the main shoot (pre- and post-generative branching). Certain trends in the evolution of modes of branching in different taxa within Poaceae are traced: from extra - to intravaginal branching, from diffuse branching to tillering, from late, post-generative to early, pre-generative branching.

TT-71-53130 PC$19.50/MF$1.45
Bureau of Sport Fisheries and Wildlife, Washington, D.C.
ANIMAL MIGRATIONS.
1974, 328p
Trans. of mono. Migratsii Zhivotnykh, Moscow. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Animal migrations, *Animal ecology, Birds, Bats, Ducks, Seasonal variations, Distribution(Property), Rabbits, Animal behavior, Abundance, Translations, USSR.

Contents:
The mute swan in the Karkinitski Bay and the results of its ringing;
Migration of the white-fronted goose;
Migration of the bean-goose;
Geographical populations of the pintail in the USA;
Some characteristic features in seasonal distribution of geographical populations of the tufted duck and the pochard in the USSR;
Seasonal distribution and migration of the spoonbill and glossy ibis;
Materials on ringing of the white pelican and pygmy cormorants;
Ties with the nesting territory, settling, of young birds and formation of new colonies in the Black-headed gull;
On the character of spring migration of the ruff, lapwing and common curlew in the center of the European part of the USSR;
Seasonal distribution and biology of the rook at the north-western coast of the Black Sea;
Migration of the brambling;
On ecology of the alpine hare;
An attempt of determination of age structure of the population of two species of bats;
Far-distant migration of the bats ringed in the Voronezh reserve.

TT-72-51065 PC$3.00/MF$1.45
Forest Service, Washington, D.C.
INFLUENCE OF BUTT ROT ON THE INTENSITY OF RESPIRATION AND THE ACTIVITY OF OXIDIZING FERMENTS IN CONIFERS (VLIYANIE KORNEVOI GUBKI NA INTENSIVNOST DYKHANIYA I AKTIVNOST OKISLITELNYKH FERMENTATOV SOSNY),
N. I. Fedorov, and E. S. Raptunovich. 1973, 12p
Trans. of Nauchnye Doklady Vysshei Shkoly. Biologicheskie Nauki (USSR) n12 p87-92 1968. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Wood, *Fungi, *Trees(Plants), Oxidation, Respiration, Pinewood, Softwoods, USSR, Translations, Fermentation, Plant pathology, Plant physiology.
Identifiers: *Butt rot fungus, Fomitopsis annosa.

Development of butt rot on pine roots leads to a decline in the activity of polyphenol oxidases, peroxidases and catalases in the roots, sapwood, and heartwood of the trunk and in the bast. Inactiviation of these ferments helps in the creation of more favorable conditions for the development of mycelium in roots and lower part of trunks and to a decrease in the activity of polyphenol oxidases, peroxidases and catalases, that is observed in the infected trees, is accompanied by an activation of cytochrome oxidases and ascorbic acid oxidases in the branches, bast and in the wood of the trunk and by a sharp fall in the activity of these ferments in healthy as well as infected roots of diseased plants.

TT-73-54016 PC$3.00
Department of Agriculture, Washington, D.C.
TARSONEMOIDES GAEBLERI SCHAARSCHMIDT (ACAR., TARSONEMIDAE)-OVIVOROUS, MITE INHABITING GALLERIES OF IPS TYPOGRAPHUS (L.) (TARSONEMOIDES GAEBLERI SCHAARSCHMIDT (ACAR., TARSONEMIDAE)--JAJOZERNY ROZTOCZ W ZEROWISKACH KORNIKA DRUKARZA 'IPS TYPOGRAPHUS' (L.)),
Stanislaw Balazy, and Bohdon Kielczewski. 1974, 12p
Trans. of Polskie Pismo Entomologiczne, SerB n1-2(37-38) p7-17 1965, by Anatol Dangel. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Mites, *Forest trees, Morphology, Larvae, Coleoptera, Distribution(Property), Translations, Poland.

Mites occur in fairly large numbers in the galleries of bark beetles as well as on their bodies, and numerous scientific publications have been devoted to this subject. It was not always possible, however, to define the role of these species accompanying bark beetles. As a result of investigations carried out in spruce stands in Poland, its occurrence was reported in 1962 in both natural regions of spruce. Parallel to field and morphological investigations the authors carried out observations on the development and biology of this species also in the laboratory under closed breeding conditions.

TT-73-54038 PC$3.00
Department of Agriculture, Washington, D.C.
COMMON MITE SPECIES OF FOREST BIOTOPES OCCURRING ON TREES AND ACCOMPANYING CERTAIN INSECTS (POSPOLITE GATUNKI ROZTOCZY BIOTOPOW LESNYCH, WYSTEPUJQCYCH NA DRZEWACH I TOWARZYSZACE NIEKTORYM OWADOM),
Bohdan Kielczewski. 1974, 9p
Trans. of Zeszyty Problemowe Postepow Nauk Rolniczch (Poland) n65 p217-223 1966, by Anatol Dangel. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Mites, *Forest trees, Insects, Plant tissues, Leaves(Botany), Distribution(Property), Pine trees, Translations, Poland.

In general mites do not belong to economically harmful forest pests. Only several species can be mentioned which can be looked upon as potential pests and which have caused some damage in recent years in neighboring countries. Progressively precise faunal studies have, however, noted that enormously rich forms inhabit forest biotopes, a fact which has led to further acariod studies, not so much from the point of view of forest protection as of forest biocenology. The report includes a number of investigations conducted by the Forest Protection Chair, to some more common species dominant in certain ecological niches.

TT-73-58050 PC$4.00/MF$1.45
Agricultural Research Service, Washington, D.C.
THE PHYSIOLOGY OF NUTRITION OF 'TILLETIYA CARIES' (DC) TUL. (FIZIOLOGIYA PITAIPYA GRIVA 'TILLETYA CARIES' (DC) TUL.),
M. A. Zarubina. 1974, 7p
Trans. of Mikologiya i Fitopatologiya (USSR) v5 p389-395 1971. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Smuts(Fungi), *Nutritional requirements, Physiology, Growth, Plant diseases, Wheat plants, Glucose, Nitrogen, Vitamins, Carbohydrates, Amino acids, Carbon, Translations, USSR.
Identifiers: Tilletiya caries, Wheat blunt.

The investigation includes studies on the physiology of nutrition of smut fungi, Tilletia caries. The disease, wheat blunt, is caused by this fungus; and establishing the nutritive requirements could help to provide a means of control for this fungus disease.

6E. Clinical Medicine

AD-779 803/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
FUNCTIONAL SIGNIFICANCE OF LOCALIZATION OF CHANGES IN CATECHOLAMINE METABOLISM IN THE CENTRAL NERVOUS SYSTEM DURING POSTDIPHTHERIAL POLYNEURITIS AND EXPERIMENTAL ALLERGIC ENCEPHALOMYELITIS,
V. V. Mikhailov, and N. G. Astafeva. 30 Apr 74, 11p Rept no. FTD-HT-23-580-74
Edited trans. of Voprosy Meditsinskoi Khimii (USSR) v16 n1 p46-51 Jan-Feb 70, by Dean F. W. Koolbeck.

Descriptors: *Catecholamines, *Central nervous system, *Nervous system diseases, Autoimmunization, Immunology, Translations, USSR, Guinea pigs, Experimental data.
Identifiers: *Immunologic diseases, *Autoimmune diseases, *Encephalomyelitis, *Diptheria.

The development of postdiphterial polyneuritis (PDN) and experimental allergic encephalomyelitis (EAE) is preceded in the preparalytic period by accumulation of catecholamines in the hypothalamus and also in those sections of the nervous system in which allergic inflammation subsequently arises (the spinal cord, the sciatic nerves). The change in the content of catecholamines has a more expressed character during PDN than during EAE. The application of sympathoparalytics (Chlorpromazine and reserpine) noticeably blocks the accumulation of mediators in the nervous tissue in guinea pigs inoculated with sublethal doses of diphterial toxin or immunized with an encephalitogenic mixture, depresses the plasmocytic reaction and the production of antibodies, inhibits the development of paralysis, and protects part of the animals from fatal illness. (Author)

AD-779 865/5GA PC$3.75/MF$1.45
Office of Naval Research London (England)
DENTAL RESEARCH - EUROPE 1973,
Herman D. Tow. 22 Apr 74, 67p Rept no. ONRL-R-3-74
See also PB-138 469.

Descriptors: *Dentistry, *Europe, Tissues(Biology), Great Britain, Laboratories, Medical research, Immunity, Response(Biology), Epidemiology, Biochemistry, Dental caries, Fluorides, Bacteria, Dental plaque, Preventive dentistry, Oral diseases.
Identifiers: Hydroxylapatite, Streptococcus mutans, Streptococcus sanquis, Actinomyces viscosus.

The report contains information concerning the activities of many of the dental research laboratories of North Europe and the United Kingdom. Areas of particular interest include: the immune response in oral disease, ultrastructure of oral tissues, bacteriology of oral disease, fluorides in relation to tooth enamel, epidemiology of oral disease, physical/chemical studies of hydroxyapatite crystals, preventive dentistry programs, identification of salivary constituents, biochemistry of dental plaque and biochemistry of the periodontium. (Author)

AD-780 038/2GA PC$4.00/MF$1.45
Academy of Health Sciences (Army) Fort Sam Houston Tex Health Care Studies Div
AMBULATORY PATIENT MEDICAL RECORDS SYSTEM PILOT PROJECT.
Progress rept. no. 2, 1 Oct 72-1 Jul 73,
Wayne R. Gallentine, and Richard B. Stuart. Sep 73, 85p Rept no. HCSD-MRII

Descriptors: *Information systems, Records, Medicine, Patients, Hospitals, Information processing, Information retrieval.
Identifiers: *Biomedical information systems, *Medical records, Ambulatory health care.

The technical objective of the study is to demonstrate the usefulness of 15 improvement actions in improving the general management and handling of out-patient medical records--to include filing, retrieval, and transmittal of such records--as well as improving the quality of the records. This study seeks to improve their outpatient medical records systems to the point that they will be an ideal demonstration of how hospitals can fully meet the principal of the Joint Commission on Accreditation of Hospitals that hospitals should maintain facilities and services that are adequate to provide accurately documented and readily accessible medical records. After a baseline systems analysis, and workload measurement at each hospital,various improvement actions are being carried out at both hospitals. (Modified author abstract)

AD-780 036/0GA PC$5.00/MF$1.45
Academy of Health Sciences (Army) Fort Sam Houston Tex Health Care Studies Div
A COMPARATIVE STUDY OF PATIENT SCHEDULING SYSTEMS FOR ARMY SICK CALL.
Final rept. 19 Mar-1 Jun 73,
Richard B. Stuart, and Arnold G. Peterson. Dec 73, 152p Rept no. HCSD-10

Descriptors: *Military medicine, *Scheduling, *Medical services, Army, Clinical medicine, Patients, Test methods, Physicians, Medical personnel.
Identifiers: Health care delivery systems, Recommendations.

In April and May 1973, five different scheduling systems for sick call were tested in three troop medical clinics at Ft. Sill, OK, using the following configurations: Troop Clinic A, staggered unit arrival for one month, followed by individual appointment for one month; Troop Clinic B, evening sick call followed by an all-day-no-appointment system and Troop Clinic C, a combination of early afternoon sick call for one month, followed by individual appointments. These systems were compared to the traditional system of holding sick call early in the morning as a mass formation. Patients and unit staff favored the individual appointment, staggered unit, and evening systems. Physicians and troop medical clinics staffs favored the appointment and the morning block systems. Sick call by appointment was shown to be feasible, although the other systems may all be useful under certain circumstances. (Modified author abstract)

AD-780 071/7GA Reprint
Massachusetts Inst of Tech Cambridge Dept of Metallurgy and Materials Science
QUANTITATIVE STUDIES OF HUMAN SUBCHONDRAL CANCELLOUS BONE: ITS RELATIONSHIP TO THE STATE OF ITS OVERLYING CARTILAGE.
Technical rept.,
James W. Pugh, Eric L. Radin, and Robert M. Rose. 1974, 12p Rept no. TR-7
Contract N00014-67-A-0204-0066
Prepared in cooperation with Children's Hospital Medical Center, Boston, Mass. Dept. of Orthopaedic Surgery.
Availability: Pub. in The Jnl. of Bone and Joint Surgery, v56-A n2 p313-321 Mar 74.

Descriptors: *Cartilage, *Bones, Anatomy, Spatial distribution, Arthritis, Joints(Physiology), Musculoskeletal diseases.
Identifiers: Subchrondral bone.

Changes in the spatial arrangement of the trabeculae (rather than the gross density of the bone) are shown to correlate with the observed increase in subchondral bone stiffening associated with loss of cartilage mucopolysaccharide. In fifteen cadavera, with no histories of degenerative joint disease and exhibiting no gross bone and cartilage changes indicative of osteoarthritis, the stiffening of 38 per cent from a normal to an early arthritic condition was accompanied by a trabecular contiguity change from 0.7 to 0.8. Since the limits on the contiguity ratio in trabecular bone are one-half and one, and the experimentally observed range is 0.6 to 0.9, this increase in contiguity ratio is quite striking. (Author)

AD-780 095/6GA PC$3.00/MF$1.45
Naval Submarine Medical Research Lab Groton Conn
VISUAL CHARACTERISTICS OF SUBMARINE SCHOOL CANDIDATES, SUBMARINERS AND NAVY DIVERS: INFORMATION DERIVED FROM THE LONGITUDINAL HEALTH STUDY.
Interim rept.,
Christine L. McKay, and Alma P. Ryan. 1 Feb 74, 16p Rept no. NSMRL-767

Descriptors: *Visual acuity, *Submarine personnel, *Divers, Ophthalmology, Vision, Performance(Human), Medical research, Naval personnel, Eye diseases.
Identifiers: Myopia.

The visual abilities of experienced submariners, submarine school candidates and navy divers were compared on several tests of visual functioning. Submariners were found to require more correction for myopia than either other group, with the divers requiring the least. There were no significant differences among the groups on measures of phoria, acuity, stereopsis, retinal vessel size or intraocular pressure. Submarine School candidates showed a closer near point (more accommodation) than either other group. They were also significantly younger. (Author)

AD-780 097/2GA PC$3.00/MF$1.45
Naval Submarine Medical Research Lab Groton Conn
CHOLESTEROL LEVELS IN SUBMARINERS: A PILOT STUDY,
Lawrence W. Shivertaker. 5 Feb 74, 15p Rept no. NSMRL-771

Descriptors: *Cholesterol, *Stress(Psychology), *Submarine personnel, Lipids, Etiology, Diet, Attitudes(Psychology), Emotions, Exercise(Physiology).
Identifiers: *Hypercholesterolemia.

Cholesterol levels were compared between two groups of subariners during the postconversion shakedown cruise of a Fleet Ballistic Missile Submarine. The subject group was comprised of men qualified in submarines. The control group was comprised of men new to submarines. Five samples of blood were drawn during the cruise. The data shows that there may be a trend toward hypercholesterolemia in those exposed to sea duty. The possible hypercholesterolemia may be a result of the separate or combined effects of emotional stress, high cholesterol diet, and/or inactivity. (Modified author abstract)

AD-780 125/1GA PC$3.00/MF$1.45
Yale Univ New Haven Conn School of Medicine
SEQUENTIAL IMMUNIZATION OF SPIDER MONKEYS WITH THREE GROUP B. ARBOVIRUSES: YELLOW FEVER, LANGAT, AND DENGUE-2.
Annual progress rept.,
Jordi Casals-Ariet. 1 May 74, 18p Rept no. 43067-74-1
Contract DADA17-73-C-3098

Descriptors: *Group B arboviruses, *Vaccines, *Immunization, Yellow fever virus, Dengue, Virus diseases.
Identifiers: Langat virus, Evaluation.

Four spider monkeys were sequentially vaccinated at 30-days intervals with yellow fever (17D), a Langat and a dengue type 2 attenuated strains. Four months after the last vaccination these monkeys and 4 controls which had been injected the vaccine substrates only were subcutaneously challenged with Japanese encephalitis virus. As anticipated, none of these animals developed signs of illness; viremia titrations done daily for seven consecutive days after challenge were used as a criterion for protection. No protection was detected as a result of vaccination. (Author)

AD-780 131/9GA Reprint
Armed Forces Inst of Pathology Washington D C
ADVERSE DRUG REACTIONS AND THE AUTOPSY: PREVALENCE AND PERSPECTIVE,
Edward W. Gotti. 24 Oct 73, 5p
Availability: Pub. in Archives of Pathology, v97 p201-204 Apr 74.

Descriptors: *Autopsy, Drugs, Pharmacology, Statistics, Hospitals, Pathology, Patients, Death, Clinical medicine, Biopsy, Surveys.
Identifiers: *Histopathology, *Drug reactions.

A survey of autopsy protocols of several major medical centers was undertaken. Cases in which a drug-induced lesion was suspected or diagnosed were noted. This information was correlated with admission or discharge and death statistics and extrapolated to estimates of the national incidence. (Modified author abstract)

AD-780 133/5GA Reprint
Armed Forces Inst of Pathology Washington D C
CARCINOID METASTATIC TO THE OVARY. A CLINICOPATHOLOGIC ANALYSIS OF 35 CASES,
Stanley J. Robboy, Robert E. Scully, and Henry J. Norris. 3 Jul 73, 15p
Availability: Pub. in Cancer, v33 p798-811 Mar 74.

Descriptors: *Cancer, *Ovaries, *Reproductive system, Neoplasms, Sex glands, Pathology, Histology, Signs and symptoms, Diagnosis(Medicine).

Thirty-five cases of carcinoid metastatic to the ovary were analyzed from a clincopathologic viewpoint. In 25 patients the ovarian tumors were discovered at laparotomy; in the remaining cases, the ovarian involvement was detected only at autopsy as a manifestation of widespread metastasis. Although one ovary was almost always enlarged, the opposite ovary was frequently enlarged also. Both ovaries contained tumor with only two exceptions. Abnormal urinary levels of 5-hydroxyindole acetic acid were often detected within several months after the operation. In all but five cases evidence for a primary carcinoid in the intestine or elsewhere was found. The prognosis was poor, with one-third of the patients dying within 1 year, and two-thirds within four years after the diagnosis of ovarian involvement. (Modified author abstract)

AD-780 134/3GA Reprint
Armed Forces Inst of Pathology Washington D C
CONGENITAL CORNEAL LEUKOMAS. 2. HISTOPATHOLOGIC FINDINGS IN 19 EYES WITH CENTRAL DEFECT IN DESCEMET'S MEMBRANE,
William M. Townsend, Ramon L. Font, and Lorenz E. Zimmerman. 1974, 17p
See also Part 1, AD-776 627.
Availability: Pub. in American Jnl. of Ophthalmology, v77 n2 p192-206 Feb 74.

Descriptors: *Eye, *Cornea, *Neoplasms, Histology, Pathology, Abnormalities, Diagnosis(Medicine), Ophthalmology.
Identifiers: *Congenital abnormalities, Descemets membrane.

Based on histopathologic findings, eyes with central defects in Descemet's membrane fell into three distinct groups: (1) Central defect with keratolenticular contact. A central leukoma was found associated with a uniformly broad central defect in Descemet's membrane, but there were no lenticular abnormalities. (2) Central defect with keratolenticular contact. Central defects were associated with variously sized defects in Descemet's membrane and some degree of keratolenticular contact. (3) Central defect in Rieger's syndrome. This case demonstrated the occurrence of a central leukoma, caused by a central defect in Descemet's membrane, in Rieger's anomaly. In the presence of a retrolental mass, iris bombe or a dislocated swollen lens, the authors postulated that the corneal defect was a passive effect of pressure by the forwardly displaced lens against the cornea at a time in development when Descemet's membrane was absent or still a delicate, thin structure.

AD-780 135/0GA Reprint
Armed Forces Inst of Pathology Washington D C
CONGENITAL CORNEAL LEUKOMAS. 3. HISTOPATHOLOGIC FINDINGS IN 13 EYES WITH NONCENTRAL DEFECT IN DESCEMET'S MEMBRANE,
William M. Townsend, Ramon L. Font, and Lorenz E. Zimmerman. 1974, 15p
See also Part 2, AD-780 134.
Availability: Pub. in American Jnl. of Ophthalmology, v77 n3 p400-412 Mar 74.

Descriptors: *Eye, *Cornea, *Neoplasms, Histology, Pathology, Abnormalities, Diagnosis(Medicine), Ophthalmology.
Identifiers: *Congenital abnormalities, Descemets membrane.

Based on histopathologic findings, eyes with congenital defects in Descemet's membrane not restricted to the central region of the cornea fell into three distinct groups: (1) Paracentral defects. The two eyes showed paracentral defects that coincided with anterior synechiae. Detachment of the adjacent, more central portion of Descemet's membrane accounted for the nebular opacity observed grossly. (2) Sector defects. Two patients had bilateral ocular involvement showing extensive defects in Descemet's membrane involving at least half of the posterior corneal surface. (3) Diffuse defects. Seven patients had unilateral diffuse corneal opacification and corresponding defects in Descemet's membrane. All were free of systemic or severe ocular malformations. Their eyes showed a diffuse defect in Descemet's membrane that corresponded with sites of keratoiridic adhesions and extremely shallow anterior chambers.

AD-780 137/6GA Reprint
Armed Forces Inst of Pathology Washington D C
DETECTION AND SIGNIFICANCE OF MATERNAL PULMONARY AMNIOTIC FLUID EMBOLISM,
William D. Roche, Jr., and Henry J. Norris. 18 Nov 73, 4p
Revision of report dated 25 Jul 73.
Availability: Pub. in Obstetrics and Gynecology, v43 n5 p729-731 May 74.

Descriptors: *Embolism, *Pregnancy, *Lung, Body fluids, Respiratory system, Pathology, Histology.
Identifiers: *Amniotic fluid, Obstetrics.

The presence of amniotic fluid in the lungs can be correlated with specific clinical situations and events. Amniotic fluid in the lungs is always a pathologic finding and can easily be demonstrated on a single random lung section if special stains are used. (Author)

AD-780 139/2GA Reprint
Armed Forces Inst of Pathology Washington D C
FATAL STRONGYLOIDIASIS IN IMMUNOSUPPRESSED PATIENTS,
David T. Purtilo, Wayne M. Meyers, and Daniel H. Connor. 10 Dec 73, 7p
Availability: Pub. in The American Jnl. of Medicine, v56 p488-493 Apr 74.

Descriptors: *Helminthic diseases, *Parasitic diseases, *Immunosuppression, Infectious diseases, Immunology, Cells(Biology), Immunity, Lymphocytes.
Identifiers: *Strongyloidiasis.

Cell-mediated immunity is a major bulwark of defense against certain viruses, intracellular bacteria, fungi and protozoa. Cell-mediated immunity against helminthic infections is inadequately understood. Thirty-two patients with strongyloidiasis who were studied at autopsy had underlying diseases characterized by depressed cell-mediated immunity, including lepromatous leprosy, malignant tumors, protein-calorie malnutrition, burn, radiation, advanced tuberculosis, tertiary syphilis or pancytopenia. At autopsy defective cell-mediated immunity against strongyloides was manifested by a lack of a granulomatous immune response to larvae in the tissues. Depletion of lymphocytes in thymus glands and in the thymus-dependent areas of lymph nodes and spleens in the hosts indicated in inadequate capacity of cell-mediated immunity for preventing Strongyloides stercoralis. (Author)

AD-780 140/0GA Reprint
Armed Forces Inst of Pathology Washington D C
FUNCTIONING TUMORS OF THE OVARY,
Henry J. Norris, and Ian Chorlton. 1974, 51p
Availability: Pub. in Clinical Obstetrics and Gynecology, v17 n1 p189-228 Mar 74.

Descriptors: *Neoplasms, *Ovaries, *Reproductive system, Histology, Pathology, Classification, Epidemiology, Population, Humans.
Identifiers: Gynecology.

Functioning tumors represent only 5-6% of ovarian tumors from human cases. Functioning ovarian tumors can be divided into five basic categories. The largest group is derived from the specialized gonadal stroma. Most of these are thecomas, but granulosa tumors, Sertoli-Leydig tumors, Sertoli tumors and nonspecific gonadal stromal tumors all belong in this category. Most lipid cell tumors, regardless of the cytologic features arise from stromal cells as well, although the taxonomic position of some in the ovarian hilus is uncertain because of uncertainty over the origin of hilus cells. Some germ cell tumors qualify as functioning ovarian tumors inasmuch as certain ones give rise to gonadotropin production and some teratomas form tissues that have endocrine activity. Rare primary epithelial tumors of the ovary have an associated endocrine effect caused by steroid production from adjacent supporting stroma, and some metastatic carcinomas also induce steroidogenesis in the stroma. There is a rare neoplasm that appears to be a combination of germ cells admixed with gonadal stroma. A classification of the basic categories of ovarian tumors and their main constituents is shown

AD-780 144/2GA Reprint
Armed Forces Inst of Pathology Washington D C
LOUSE-BORNE RELAPSING FEVER IN MAN,
David M. Judge, Irwin Samuel, Peter L. Perine, and Dushan Vukotic. 18 Sep 73, 6p
Availability: Pub. in Archives of Pathology, v97 p136-140 Mar 74.

Descriptors: *Bacterial diseases, *Borrelia, Infectious diseases, Hepatitis, Bacteria, Ethiopia, Humans, Autopsy, Heart, Spleen, Spirochaetaceae, Pathology, Histology, Myocardium.
Identifiers: *Louse borne relapsing fever, Borrelia recurrentis, Myocarditis.

Six Ethiopians with louse-borne relapsing fever died suddenly 4 to 12 hours after being treated with antibiotics. Autopsies demonstrated a diffuse myocarditis, hepatitis, and splenic microabscesses. The patients probably died of sudden myocardial failure during the hypotensive phase of the induced crisis. Autopsies on two additional patients with louse-borne relapsing fever, whose deaths appeared to be unrelated to the crisis, showed similar changes. (Modified author abstract)

AD-780 145/9GA Reprint
Armed Forces Inst of Pathology Washington D C
THE NATURE OF THE ORANGE PIGMENT OVER A CHOROIDAL MELANOMA: HISTOCHEMICAL AND ELECTRON MICROSCOPICAL OBSERVATIONS,
Ramon L. Font, Lorenz E. Zimmerman, and Mansour F. Armaly. 17 Nov 72, 5p
Availability: Pub. in Archives of Ophthalmology, v91 p359-362 May 74.

Descriptors: *Retina, *Neoplasms, *Eye, Ophthalmology, Pathology, Histology, Pigments, Histological techniques, Electron microscopy.
Identifiers: Histochemistry, Fuscin, *Lipofuscin.

A mottled pigmented choroidal mass, superotemporal to the right macula of a 59-year-old white man, was interpreted as a malignant melanoma. Over portions of tumor there was a yellow-orange pigment, which on angiography obscured the background fluorescence within the tumor. After enucleation, the pigment was localized to the plane of the pigment epithelium along the inner surface of the choroidal melanoma. Microscopical examination disclosed that the orange pigment was contained within proliferated retinal pigment epithelial cells and in macrophages located both within and under the degenerated retina. Histochemical and electron microscopical studies provided conclusive evidence that the pigment was lipofuscin. (Author)

AD-780 146/7GA Reprint
Armed Forces Inst of Pathology Washington D C
PRIMARY INTRAORBITAL MENINGIOMAS,
Louis A. Karp, Lorenz E. Zimmerman, Adam Borit, and William Spencer. 1 Mar 73, 7p
Availability: Pub. in Archives of Ophthalmology, v91 p24-28 Jan 74.

Descriptors: *Neoplasms, *Optic nerve, *Meninges, Membranes(Biology), Cranial nerves, Eye, Blindness, Diagnosis(Medicine), Pathology, Histology, Ophthalmology, Signs and symptoms.

The clinical and pathologic characteristics of 25 patients with primary intraorbital meningiomas were reviewed. The racial and sex predilections and the histologic characterics of the tumors were found to be similar to those of intracranial meningiomas, but the primary intraorbital meningiomas were found to be more common and more aggressive in children than are meningiomas in other locations. Meningiomas should be considered in the differential diagnosis of any lesion in a patient with progressive exophthalmos or visual loss, even in the first two decades of life, and the meningiomas should be treated surgically. (Author)

AD-780 147/5GA Reprint
Armed Forces Inst of Pathology Washington D C
THE ROBERTS SYNDROME,
Mahlon V. R. Freeman, Derek W. Williams, R. Neil Schimke, Samia A. Temtamy, and Eduardo Vachier. 26 Jun 73, 17p
Availability: Pub. in Clinical Genetics, v5 p1-16 1974.

Descriptors: *Abnormalities, Pathology, Diagnosis(Medicine), Signs and symptoms, Genetics, Genes.
Identifiers: *Roberts syndrome, *Congenital abnormalities, *Chromosomes abnormalities.

The Roberts syndrome consists of tetraphocomelia, cleft lip/palate, and prominence of the phallus. This paper summarizes the major phenotypic abnormalities of 17 previously reported cases and reports five new cases. The features to be considered in the diagnosis of the Roberts syndrome are: tetraphocomelia with ectrodactyly and syndactyly, cleft lip/palate with protrusion of the intermaxillary portion of the upper jaw, Ocular hypertelorism, prominence of the phallus, cryptorchidism in the male, and intra- and extra-uterine growth retardation. Analysis of pedigrees suggests autosomal recessive inheritance. The morphologic appearance of the metaphase chromosomes in one case was unusual and unexplained. (Author)

AD-780 229/1GA PC$3.75/MF$1.45
Naval Dental Research Inst Great Lakes Ill
CARIES IMMUNITY IN NAVAL RECRUITS AND ANCIENT HAWAIIANS.
Research progress rept.,
Harris J. Keene, Irvine L. Shklair, and Kirk C. Hoerman. May 74, 51p* Rept no. NDRI-PR-74-03

Descriptors: *Dental caries, Immunity, Naval personnel, Hawaii, Surveys, Population, Epidemiology, Dentistry, Public health.

The report summarizes a 10-year crossectional and longitudinal survey of the dental health of naval recruits. Specific attention is directed to the epidemiologic, microbiologic, biochemic, nutritional, genetic and familial characteristics of the absolutely caries-free recruit. Data are also presented on the dental pathological changes which were observed in the skeletal material of ancient Hawaiians from Mokapu, Oaku. (Author)

AD-780 305/9GA Reprint
School of Aerospace Medicine Brooks AFB Tex
A SIMPLE APPARATUS AND PROCEDURE FOR DIGESTION OF BIOLOGIC MATERIALS IN DETERMINATIONS OF NONVOLATILE ELEMENTS.
Rept. for May 69-Jul 70,
Donald M. Ducharme, and Leonel F. Pena. 1974, 6p Rept no. SAM-TR-72-553
Availability: Pub. in The American Jnl. of Clinical Nutrition, v27 p528-530 May 74.

Descriptors: *Food, *Diet, *Digestion(Biology), Nutrition, Chemical analysis, Equipment.
Identifiers: Clinical nutrition.

A method is presented for the temperature controlled digestion of biologic material for analysis of nonvolatile elements. A simple glass apparatus is described for use with a standard Kjeldahl digestion rack equipped with a sand bath. Multiple digestions can be accomplished simultaneously. (Author)

AD-780 324/0GA Not available NTIS
Defence and Civil Inst of Environmental Medicine Downsview (Ontario)
SERUM CREATINE PHOSPHOKINASE LEVELS IN RATS FOLLOWING COLD INJURY.
Research paper,
W. S. Myles, and T. E. Brown. 5 Feb 73, 9p Rept no. DCIEM-RP-913
Availability: Pub. in International Jnl. of Biometeorology, v17 n2 p177-184 1973.

Descriptors: *Frostbite, Biochemistry, Blood serum, Enzymes, Tissues(Biology), Wounds and injuries, Pathology, Rats, Laboratory animals, Experimental data, Canada.
Identifiers: *Kinase(Phosphorylating)/creative.

The validity of serum creatine phosphokinase (CPK) as an index of tissue damage due to cold injury was tested in the rat. Immersion of the feet in the freezing mixture (salt and ice, -19 plus or minus 1C) for one or five minutes produced reversible and irreversible damage, respectively. The increase in CPK activity over a 5-hr period following freezing showed that the severity and extent of cold injury was associated with the amount of CPK released into the bloodstream. Exposure of the whole rat to cold air at -29C for three hours resulted in a highly variable increase in serum CPK two hours after exposure which was related to the degree of hypothermia during the exposure. The extent of hypothermia was also related to the amount of tissue loss estimated two weeks after the exposure. (Modified author abstract)

AD-780 338/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
MATERIALS FROM CLINICAL STUDY OF THE BIOLOGICAL ACTIVITY OF TSUVERKALOV DYSENTERIN,
V. A. Fradkin, L. M. Lodinova, S. A. Khotsyanova, O. A. Sakharova, and V. I. Lepushinskaya. 24 May 74, 8p Rept no. FTD-HT-23-1264-74
Edited trans. of Vrachebnoe Delo (USSR) n8 p142-144 Aug 70, by Dean F. W. Koolbeck.

Descriptors: *Dysentery, *Diagnostic agents, Antigen antibody reactions, Skin(Anatomy), Biological agents, Bacteria, Bacterial diseases, Dosage, USSR, Translations.
Identifiers: *Allergenic extracts, *Skin tests.

The sensitizing activity was studied of an allergen dysenterin following its intracutaneous administration. It was found that a diagnostic dose of the allergen containing 75-100 mcg of protein in 0.1 ml exerts a sensitizing effect. It is shown that decrease of the concentration by three times ensures a similar diagnostic result as compared with the initial concentration.

AD-780 342/2GA Reprint
California Univ Berkeley Naval Biomedical Research Lab
DERMAL SENSITIVITY TO DIFFERENT DOSES OF SPHERULIN AND COCCIDIOIDIN,
David A. Stevens, H. B. Levine, and David R. TenEyck. 30 Oct 73, 5p
Prepared in cooperation with Santa Clara Valley Medical Center, Calif. Div. of Infectious Diseases, California Univ., Berkeley. Naval Medical Research Unit No. 1, and Pan American Health Organization, Washington, D.C. Dept. of Research Development and Coordination. Revision of report dated 30 Oct 73.
Availability: Pub. in Chest, v65 n5 p530-533 May 74.

Descriptors: *Coccidioides, *Diagnostic agents, *Fungus diseases, Infectious diseases, Ascomycetes, Skin(Anatomy), Antigen antibody reactions, Hypersensitivity.
Identifiers: Coccidioides immitis, Allergenic extracts, *Coccidioidin, *Spherulin, *Skin tests.

Spherulin, a new reagent, was compared with coccidioidin for eliciting delayed dermal hypersensitivity in 298 human subjects living in an area endemic for Coccidioides immitis. As standard (dilute) doses, spherulin detected 32 percent more reactors than coccidioidin. A tenfold higher concentration of spherulin showed a 50% higher reactor ratio than did a tenfold higher dose of coccidioidin in subjects nonreactive to the standard dose of either regeant. Severe local reactions were encountered in only one subject; these reactions were produced by the low doses of both coccidioidin and spherulin. Evidence is presented that latent sensitivity to coccidioidin can be made apparent by a reaction to spherulin. (Author)

AD-780 350/5GA Reprint
Naval Hospital Long Beach Calif
EXCEPTIONAL BLOOD LOSS ANEMIA: TREATMENT WITH HYPERBARIC OXYGEN,
George B. Hart. 1974, 2p
Availability: Pub. in JAMA, v228 n8 p1028-1029, 20 May 74.

Descriptors: *Anemias, *Hemorrhage, Hypoxia, Therapy, Oxygen, Hyperbaric conditions.
Identifiers: *Hyperbaric medicine, *Hyperbaric oxygenation.

Three patients with acute blood loss anemia, who had refused blood transfusions because of religious beliefs, were in hypovolemic shock and were treated with hyperbaric oxygen. Treatment with hyperbaric oxygen resulted in dramatic improvement, with reversal of the signs and symptoms of hypoxia in all three patients. Patient two continued to bleed, becoming progressively stuporous until the fourth hospital day (hematocrit reading, 7.5%), when her husband consented to the administration of two units of packed RBC.

AD-780 351/3GA Reprint
School of Aerospace Medicine Brooks AFB Tex
THE APPLICATION OF ELECTROCARDIOGRAPHIC SCREENING AND EXERCISE TESTING TO PREVENTIVE CARDIOLOGY,
Victor F. Froelicher, Jr.. 1973, 18p Rept no. SAM-CR-73-270
Availability: Pub. in Preventive Medicine, v2 p592-607 1973.

Descriptors: *Preventive medicine, *Electrocardiography, *Cardiovascular diseases, *Coronary disease, Exercise(Physiology), Medical

examination, Selection, Population, Risk, Diagnosis(Medicine).
Identifiers: Health screening.

The resting electrocardiogram and the electrocardiographic response to exercise testing are methods of screening for silent coronary artery disease. This paper presents a review of the studies reporting findings using these methods in screening asymptomatic populations. The use of serial resting electrocardiograms has a definite but limited value in preventive cardiology. Exercise testing has a greater yield of abnormals and the data regarding its specificity and sensitivity are discussed. Highly significant risk ratios have been demonstrated and exercise testing can be a valuable screening tool yielding information additional to the cardinal risk factors. (Author)

AD-780 352/1GA Reprint
Naval Hospital Long Beach Calif
HYPERBARIC OXYGEN AS CLINICAL THERAPY: HOAX OR BREAKTHROUGH,
George B. Hart. 1973, 10p
Availability: Pub. in Proceedings of the San Diego Biomedical Symposium, San Diego, Calif. 31 Jan-2 Feb 73 v12 p313-320 1973.

Descriptors: *Oxygen, Meetings, Hyperbaric conditions, Clinical medicine, Therapy, Experimental data, Patients, Physiology.
Identifiers: *Hyberbaric oxygenation, *Hyperbaric medicine.

It is felt that hyperbaric oxygen is indicated as a primary treatment in carbon monoxide intoxication, decompression illness and air embolism. It is a useful adjunct to therapy in refractory osteomyelitis, osteoradionecrosis and clostridial nyonecrosis and it appears it will be most useful as an adjunct for burn therapy, cutaneous ulcerations, peripheral vascular insufficiency and cerebral vascular insufficiency. An economical source for oxygen therapy is available in a single place chamber which insures a pure oxygen delivery system.

AD-780 394/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
IMMUNOLOGIC INDICES DURING SENSITIZATION OF ANIMALS WITH ANTIGEN FROM CULTURES OF 'TRICHOPHYTON RUBRUM',
B. B. Tseitlina. 24 May 74, 11p Rept no. FTD-HT-23-1294-74
Edited trans. of Vestnik Dermatologii i Venerologii (USSR) v44 n7 p36-39 Jul 70, by Dean F. W. Koolbeck.

Descriptors: *Fungus diseases, *Diagnostic agents, *Allergic diseases, Sensitivity, Skin(Anatomy), Antigen antibody reactions, Immunology, Guinea pigs, Experimental data, USSR, Translations.
Identifiers: *Trichophyton rubrum, Allergenic extracts, *Skin tests.

A specific allergic state develops after sensitization of guinea pigs by intracutaneous inoculation of T. rubrum vaccine. Allergic tests were used for detection of sensitization: skin tests, Prausnitz-Kustner test, CFT in the cold and anaphylaxy test with desensitization. The skin reaction of the immediate type was observed in 58.3%, of the delayed type--in 97.9% of the animals. Prausnitz-Kustner test was found to be positive in 44.1% of guinea pigs, positive CFT--in 77.5%. All guinea pigs showed a positive anaphylaxy test with desensitization. (Modified author abstract)

AD-780 413/1GA Reprint
Naval Medical Research Inst Bethesda Md
DEMONSTRATION OF A BLOCKING FACTOR IN THE PLASMA AND SPINAL FLUID OF PATIENTS WITH SUBACUTE SCLEROSING PANENCEPHALITIS.
Medical research progress rept. no. 2,
Aftab Ahmed, Douglas M. Strong, Kenneth W. Sell, Gary B. Thurman, and Richard C. Knudsen. 26 Oct 73, 26p
Availability: Pub. in Jnl of Experimental Medicine, v139 n4 p902-924, 1 Apr 74.

Descriptors: *Encephalitis, *Nervous system diseases, *Immunology, Leukocytes, Blood plasma, Cerebrospinal fluid, Virus diseases, Lymphocytes, Measles viruses.

Conflicting reports on the immune responsiveness of patients with subacute sclerosing panencephalitis (SSPE) have been reported. This report shows that the leucocytes from four SSPE patients exhibited strong sensitivity to both measles and SSPE virus preparations as measured by the macrophage migration inhibition test, mixed lymphocyte virus infected cell culture test, and the lymphotoxin assay. (Modified author abstract)

COO-2208-6 PC$8.50/MF$1.45
Cleveland Clinic Foundation, Ohio (Usa). Dept. Of Artificial Organs.
AVAILABLE SPACE FOR A TOTALLY IMPLANTABLE CARDIAC PROSTHESIS. ANNUAL PROGRESS REPORT, APRIL 1, 1973--MARCH 31, 1974.
Y. Nose. 2 Apr 74, 110p
Contract AT(11-1)-2208

Descriptors: (*Chest, *Anatomy), Biological models, Biomedical radiography, Images, Mechanical heart, Patients.

For abstract, see NSA 29 12, number 31632.

IEA-280 PC$4.25/MF$1.45
Instituto de Energia Atomica, Sao Paulo (Brazil).
RADIOISOTOPE PROFILE SCANNING TECHNIQUES FOR DIAGNOSIS OF DISEASES OF THE VERTEBRAL CANAL, SPINAL CORD, AND ITS MEMBRANES. PART I. DESCRIPTION, CHARACTERISTICS, AND PERFORMANCE OF THE DETECTION AND SCANNING SYSTEM.
A. F. Thom, R. R. Pieroni, and J. Kieffer. Nov 72, 21p
In Portuguese.

Descriptors: (*Skeletal diseases, *Diagnostic techniques), (*Nervous system diseases, Diagnostic techniques), (*Spinal cord, *Radioisotope scanning), (*Vertebrae, Radioisotope scanning), Albumins, Cerebrospinal fluid, Flow rate, In vitro, Iodine 131, Labelled compounds, Nuclear medicine, Patients, Performance testing, Radioisotope scanners, Radionuclide administration.

For abstract, see NSA 29 12, number 29918.

IEA-281 PC$5.00/MF$1.45
Instituto de Energia Atomica, Sao Paulo (Brazil).
RADIOISOTOPE PROFILE SCANNING TECHNIQUES FOR DIAGNOSIS OF DISEASES OF THE VERTEBRAL CANAL, SPINAL CORD, AND ITS MEMBRANES. PART II. APPLICATION TO CLINICAL INVESTIGATIONS AND BASIC RESEARCH.
A. F. Thom, R. R. Pieroni, and J. Kieffer. Nov 72, 36p
In Portuguese.

Descriptors: (*Skeletal diseases, *Diagnostic techniques), (*Nervous system diseases, Diagnostic techniques), (*Spinal cord, *Radioisotope scanning), (*Vertebrae, Radioisotope scanning), Albumins, Cerebrospinal fluid, Flow rate, Iodine 131, Labelled compounds, Nuclear medicine, Patients, Radionuclide administration.

For abstract, see NSA 29 12, number 29919.

JPRS-62005 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
CHANGES IN LATE COMPONENTS OF EVOKED POTENTIALS UNDER NORMAL CONDITIONS AND IN FOCAL BRAIN PATHOLOGY IS RELATED TO STIMULI VARYING IN SIGNIFICANCE,
V. E. Mayochik, and G. A. Muratova. 16 May 74, 12p
Trans. of Zhurnal Vysshei Nervnoi Deyatelnosti (USSR) n4 p782-790 1973.

Descriptors: *Brain neoplasms, *Electroencephalography, *CNS disorders, Cerebral cortex, Vision, Motor reactions, Pathology, Pathophysiology, Diagnosis, Neurology, USSR, Translations.
Identifiers: *Evoked responses.

When stimuli with signal significance are delivered, healthy subjects demonstrate an increase in amplitude and duration of late positive oscillation (LPO) and negative slow wave (NSW) in the central regions by an average of 20-25% of the initial levels. Under the same conditions, the duration and amplitude of late components in response to significant stimuli fluctuate over a wider range (150-220% of initial levels) in performing the motor reactiion, in patients with brain tumors. Some patients develop interhemispheric asymmetry of late components due to greater increase in amplitude and duration of NSW in the region of the pathological focus.

PB-232 547/0GA PC$3.00/MF$1.45
Utah Univ., Salt Lake City. Coll. of Medicine.
THYROID FUNCTION IN CHRONIC RENAL FAILURE.
Annual rept. 1 Jun-31 Dec 73,
German Ramirez. 25 Feb 74, 15p* AK-1-73-2223
Contract PHS-73-2223

Descriptors: *Thyroid gland, *Renal failure, *Goiters, Urologic diseases, Thyroid diseases, Thyroxine, Triiodothyronine, Thyroid hormones, Iodine inorganic compounds.
Identifiers: Hemodialysis.

Patients with renal failure and patients on chronic hemodialysis have a high prevalence of goiter (58% for patients on chronic hemodialysis). Thyroid function studies are showing low 131I uptake, low serum thyroxine, normal or low serum triiodothyronine and normal thyrotrophic hormone levels. Administration of bovine thyrotropin (TSH) in normal and dialysis patients was followed by a rise in serum thyroxine and triiodothyronine levels in both groups. However, the response of the dialysis patients is blunted. Inorganic iodide serum concentration was found to be high in renal failure and dialysis patients in comparison to the controls.

PB-232 600/7GA PC$4.00/MF$1.45
Cornell Univ. Medical Coll., New York.
THE ANTIGENICITY AND IMMUNOGENICITY OF 'MYCOPLASMA PNEUMONIAE' VACCINES.
Progress rept. 15 Feb 73-14 Jan 74,
Laurence B. Senterfit. 14 Jan 74, 20p IDB-VDP-01-080
Contract PHS-70-2605
See also PB-231 517.

Descriptors: *Mycoplasma, *Vaccines, Humans, Immunity, Evaluation, Bioassay, Laboratory animals, Antigens + antibodies, Attenuation, Serology.
Identifiers: Respiratory syncytial virus, Mycoplasma pneumoniae, Adjuvants, Radioimmunoassay, Poly(inosinic acid), Poly(Cytidylic acid).

The potency and stability testing of inactivated mycoplasma pneumoniae vaccines produced at Ohio State University has been completed. The results indicate these vaccines to be immunogenic and worthy of clinical trial. Safety tests indicate them to be safe for human use. Serologic testing on the sear of volunteers receiving the vaccine in-

dicate the vaccines to be immunogenic in humans. Studies of the adjuvanting effects of Poly I:C with Mycoplasma pneumoniae vaccines have shown this polynucleotide to be effective as an adjuvant.

PB-232 601/5GA PC$3.75/MF$1.45
California Univ., San Francisco. Pediatric Immunologic Lab.
QUANTITATION OF SERUM ANTIBODY TO PNEUMOCOCCAL POLYSACCHARIDES FOLLOWING NATURAL INFECTION AND SPECIFIC IMMUNIZATION.
Final rept. 7 Jun 71-6 Jun 73,
Arthur J. Ammann. Oct 73, 58p IDB-VDP-06-096
Contract PHS-71-2203
See also PB-210 336.

Descriptors: *Diplococcus, *Vaccines, *Hemagglutination, Antibodies, Assaying, Polysaccharides, Immunity, Serology, Bacteria, Humans, Responses.

An indirect hemagglutination method has been divised for the quantitation of antibody to pneumococcal polysaccharide. The method has been found to be simple, accurate, reproducible, rapid and inexpensive. Large number of serums can be assayed and serum antibody levels appear stable for at least two years when stored at -20C. The method has been used to determine the following: Stability of antibody prolonged storage; immunoglobulin classes responsible for antibody titer; temporal appearance of antibody; duration of fold increase; antibody response to monovalent and hexavalent immunization in children and adults; background antibody levels from birth to old age; and antibody response following immunization in selected populations.

PB-232 618/9GA PC$3.25/MF$1.45
Connecticut Univ. Health Center, Farmington. School of Medicine.
CLINICAL EVALUATION OF BACTERIAL POLYSACCHARIDE VACCINES.
Rept. for 18 Apr-31 Dec 73,
R. Gold, M. L. Lepow, and I. Goldschneider. 31 Dec 73, 33p IDB-VDP-01-079
Contract N01-AI-22502

Descriptors: *Neisseria meningitidis, *Vaccines, Responses, Infants, Dosage, Evaluation, Bacteria, Polysaccharides, Immunity, Antibodies, Bacterial diseases, Infectious diseases.

Results of the antibody response of infants to the group A. meningococcal vaccine are reported. No significant antibody response to the group A vaccine administered at three months of age was detected with doses of 5, 62.5, 100 or 200 micrograms of polysaccharide. Almost 60% of infants had detectable anti-A polysaccharide antibody at 2-3 months of age and the geometric mean concentration was 0.35 micrograms/ml. At 7 and 12 months of age, significant rises in antibody concentration were induced with both the 25 and 100 micrograms doses. No significant difference was apparent between doses of 25 and 100 micrograms at 7 and 12 months of age with either 1 or 2 degrees immunization. However, unlike the situation with the group C meningococcal vaccine in which 1 degree immunization at three months of age results in a damping of the response to booster doses compared to 1 degree immuaization at 7 or 12 months of age, a significant anamnestic response is seen with the group A vaccine.

PB-232 620/5GA PC$3.00/MF$1.45
North Carolina Univ., Chapel Hill.
CLINICAL EVALUATION OF RESPIRATORY VACCINES IN CHILDREN AND INFANTS.
Annual rept. 1 Apr 73-31 Mar 74,
S. Paul Glezen, Gerald W. Fernald, Albert M. Collier, Wallace A. Clyde, Jr., and Floyd W. Denny. 19 Dec 73, 11p IDB-VDP-12-076
Contract N01-AI-22505
See also PB-218 912.

Descriptors: *Respiratory diseases, *Viral diseases, *Vaccines, *Influenza virus, Evaluation, Immunity, Children, Infants, Dosage, Dose rate, Responses.
Identifiers: *Respiratory syncytial virus, *Respiratory syncytial virus vaccine.

The purpose of these studies has been to test the safety, infectivity, antigenicity, immunogenicity and person-to-person spread of attenuated respiratory vaccines. Small trials of the RS virus vaccine candidate, ts-1 mutant, have been performed in a day care center. Surveillance for natural RS virus infections has been maintained and none of the children who received the vaccine have had evidence of natural reinfection during the past two years. A clinical evaluation of an attenuated influenza vaccine ts-1E carrying the hemagglutinin and neurominidase antigens of the A2/HK/68 strain was initiated. Studies are in progress to determine: the occurrence of virus shedding, and alteration in pulmonary function, the antibody response in serum and nasal washings, and the peripheral lymphocyte response to the vaccine.

PB-232 621/3GA PC$5.25/MF$1.45
Pennsylvania Univ., Philadelphia. School of Medicine.
SURVEILLANCE OF PNEUMOCOCCAL INFECTION FOR FIELD TRIALS OF POLYVALENT PNEUMOCOCCAL VACCINE.
Annual rept. 1 Feb 73-31 Jan 74,
Robert Austrian. 1 Feb 74, 41p IDB-VDP-01-086
Contract NO1-AI-32517
See also PB-218 946.

Descriptors: *Diplococcus, *Vaccines, Polysaccharides, Immunity, Bacteria diseases, Respiratory diseases, Humans, Bacteria, Serology, Epidemiology, Evaluation.
Identifiers: Radioimmunoassay.

The report, covering the period of February 1, 1973 to January 31, 1974 represents a complete review of the surveillance of pneumococcal infection for field trials of polyvalent pneumococcal vaccine through September 1, 1973, in which all aspects of the program are presented in detail. The material included in this report represents an updating of data submitted previously and an account of the current status of the program. Fifty-five strains of type 18 were studied, 32 of which were isolates from the middle ear. Type 18C(56) accounted for 48(88%) of the strains. No strain of type 18F(18) has been identified. The results correspond with the distribution of isolates of type 18 in Denmark from all sources. The numbers of subtypes of all isolates recovered both from adults and from children with otitis media and examined with factor sera are listed.

PB-232 622/1GA PC$3.25/MF$1.45
Children's Hospital Medical Center, Boston, Mass.
STUDIES ON 'HEMOPHILUS INFLUENZAE' B VACCINE.
Annual rept., 24 Mar 73-22 Mar 74,
Porter Anderson, and David H. Smith. 22 Mar 74, 37p IDB-VDP-01-092
Contract N01-AI-12196
See also PB-221 599.

Descriptors: *Haemophilus influenzae, *Vaccines, Serology, Bacteria, Immunity, Influenza, Antibodies, Infectious diseases, Polysaccharides, Bioassay, Dosage, Responses.

The annual report details the experience with the antibody responses of infants immunized with purified polysaccharide complex (PRP) in each of several dosage regimes, including combination with diptheria pertussis tetanus and meningococcal polysacharides. Anti-PRP antibody responses following Hemophilus influenzae b meningitis are also reported. The properties and immunogenicity for rabbits of a high molecular weight, less purified PRP are summarized. The radioantigen (3H-PRP) binding assay for antibody has been reevaluated and compared to a similar assay that used 125I-PRP.

PB-232 679/1GA PC$6.75/MF$1.45
Applied Management Sciences, Inc., Silver Spring, Md.
SURVEY OF DRUG INFORMATION NEEDS AND PROBLEMS ASSOCIATED WITH COMMUNICATIONS DIRECTED TO PRACTICING PHYSICIANS. PART I: PHYSICIAN INFORMATION SURVEY.
Final rept.,
Arthur Ruskin. 8 May 74, 294p* G-10-pt-1 FDA-D-ADMC-3
Contract FDA-72-201
Paper copy also available in set of 3 reports as PB-232 678-SET, PC$14.00.

Descriptors: *Physicians, *Drugs, *Data acquisition, Information, Surveys, Sources, Mass media, Periodicals.
Identifiers: *Prescription drugs, Advertising.

The report describes survey of practicing physician's communication of drug information patterns and feelings about same during the early 1970's. Specialty journals have the highest estimated readership rate among the national journals. JAMA has the highest overall readership of the journal considered. The estimated total readership of the FDA DRUG BULLETIN is higher than that of any other periodical included in the survey. The PDR is the most widely used and most often consulted source of drug information. Package inserts are the most often used of the drug company information sources. Peer colleague and consultants are the most often used personal contacts. Use of textbooks occurs less frequently than the use of other printed material. Physicians spend an average of 19 minutes per day acquiring drug information. The desire more time for the acquisition of drug information. An estimated 87% need information correlating drug prices with quality.

PB-232 680/9GA PC$4.75/MF$1.45
Applied Management Sciences, Inc., Silver Spring, Md.
SURVEY OF DRUG INFORMATION NEEDS AND PROBLEMS ASSOCIATED WITH COMMUNICATIONS DIRECTED TO PRACTICING PHYSICIANS. PART II: DRUG BULLETIN SURVEY.
Final rept.,
Arthur Ruskin. 22 Feb 74, 131p* G-10-pt-2 FDA-D-ADMC-1
Contract FDA-72-301
Paper copy also available in set of 3 reports as PB-232 678-SET, PC$14.00.

Descriptors: *Physicians, *Data acquisition, *Drugs, Surveys, Information, Sources, Periodicals, Utilization.
Identifiers: *Prescription drugs.

The report describes study and survey of practicing physician's knowledge of the FDA Drug Bulletin newsletter. 85% had seen the FDA Drug Bulletin. 99% of these read or scanned it, and 27.2% read it completely. 93% desire receiving it/95.3% desire continuance by direct mail delivery of it. 42% of those who had seet it indicated they had been influenced by it to change their prescribing practices. The publication is regarded as informative, clear, concise, and of high interest.

PB-232 681/7GA PC$4.75/MF$1.45
Applied Management Sciences, Inc., Silver Spring, Md.
SURVEY OF DRUG INFORMATION NEEDS AND PROBLEMS ASSOCIATED WITH COMMUNICATIONS DIRECTED TO PRACTICING PHYSICIANS. PART III. REMEDIAL AD SURVEY.
Final rept.,
Arthur Ruskin. 22 Feb 74, 134p* G-10-pt-3 FDA-D-ADMC-2
Contract FDA-72-301

Paper copy also available in set of 3 reports as PB-232 678SET, PC$14.00.

Descriptors: *Physicians, *Drugs, *Data acquisition, *Mass media, Public relations, Attitudes, Surveys, Information, Sources, Periodicals.
Identifiers: *Advertising, *Prescription drugs.

The report describes study of practicing physician's knowledge about and thoughts on remedial advertisements about drugs. Almost 25% had seen the remedial ad specified. Of these, 87% clearly recognized the advertisement's remedial purpose. Over 88% felt that the misleading features of the offending ad were made clear. 76% felt that remedial ads are apt to deter deceptive drug ad practices. Of those that had seen the remedial ad, 62% thought that remedial ads were the appropriate means of conveying corrective information. 79% thought that the government should place public service ads on drugs in medical journals. However, almost 60% felt that such ads should not be placed in the public media. Due to remedial ads, over 12% of those had ceased or decreased their use of the drug.

PB-232 782/3GA PC$7.50/MF$1.45
California Univ., Los Angeles. School of Public Health.
INNOVATIVE CHANGES IN HEALTH CARE IN THE UNITED STATES. 1971-1973. AN ANNOTATED INVENTORY.
Final rept. 21 Mar 71-11 Mar 73,
Charles E. Lewis, and Rosalyn Ann Deigh. 1973, 346p* BHSR-74-33
Contract HSM-110-71-68

Descriptors: *Medical services, *United States, Hospitals, Manpower, Medical personnel, Surveys, Medical records, Questionnaires, Meetings, Public health, Physicians, Nursing, United States, Recommendations, Evaluation.
Identifiers: *Health care delivery systems, *Innovations, Regional analysis.

The project developed and established a system to obtain, process and report information on innovations in methods of providing health care, including the organization, financing and regionalization of health services and the use of health manpower. To accomplish this, a series of regions were delineated with a coordinator in each who identified and followed up innovations in his area. Contacts were established with key national medical and health organizations, with area and state medical societies, with hospital associations, schools of medicine and nursing, health departments, voluntary health agencies and other appropriate groups and individuals in the regions. The nature and magnitude of unpublicized innovations in health care delivery were determined among private physicians who identified themselves as 'innovators' or were so designated by their peers. Tables are included.

PB-232 787/2GA PC$6.75/MF$1.45
California Univ., Los Angeles. School of Public Health.
MEDICAID SERVICES IN CALIFORNIA UNDER DIFFERENT ORGANIZATIONAL MODES.
Final rept. 16 Jun 69-31 May 72,
Foline E. Gartside, Carl E. Hopkins, and Milton I. Roemer. Dec 73, 300p* BHSR-74-38
Grant PHS-HS-00140

Descriptors: *California, *Medical services, Quality control, Organizations, Health insurance, Benefit cost analysis, Evaluation, Social security, Manpower utilization.
Identifiers: Medicaid, Health services research and development, Health care delivery systems.

The report presents the results of a study of costs, utilization and quality of care provided to Medicaid (Medi-Cal) recipients in California under six differing modes of delivery: fee-for-service; a foundation having a capitation arrangement; a non-capitation foundation; a prepaid group practice; a federally-funded neighborhood health center; and a hospital-based country health department system. The authors have attempted, through the use of Medi-Cal paid claims data for each of the modes selected, to develop comparative data on performance with respect to costs, utilization, quality, and patient satisfaction. The report presents descriptive material for each of the modes and analyzes the impacts of organization, review and control mechanisms, and Medi-Cal case load on the above variables.

PB-232 788/0GA PC$8.00/MF$1.45
Indiana Univ. Foundation, Bloomington.
THE ECONOMIC BENEFITS OF MEDICARE TO THE AGED: A MICRO-SIMULATION STUDY.
Final rept. 1 Mar 72-6 Mar 73,
Ernst W. Stromsdorfer, and Ronald K. Hofer. Jun 73, 351p* BHSR-74-39
Contract PHS-HS-00865

Descriptors: *Medical services, *Economic analysis, Health insurance, Simulation, Benefit cost analysis, Social security, Models, Evaluation, Cost estimates.
Identifiers: Health services research and development, *Elderly persons, *Medicare.

The study sought to estimate the impact of Medicare on the economic welfare of aged families over the period 1966 to 1986. It focused on four issues: Whether aged families are better off financially as a result of Medicare; how any money benefits are distributed among aged familes; what the increased medical care outlays are following Medicare; and how medical outlays are distributed among aged families before and after Medicare. A simulation model of the Medicare system was developed to predict family net worth, personal medical care expenditures, health insurance premiums and health insurance benefits. Results of the simulations show that Medicare improves the economic welfare of aged families, but the impact is small due to the size of Medicare deductibles and coinsurance rates and from lack of coverage of important medical care inputs, such as outpatient drugs.

PB-232 920/9GA PC$5.50/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
LICENSED PRACTICAL NURSES IN OCCUPATIONAL HEALTH. AN INITIAL SURVEY.
Final rept. Nov 71,
Jane A. Lee, Ruth R. Herzog, and John H. Morrison, Jr. 1974, 49p NIOSH-TR-206-74, DHEW/NIOSH-74-102

Descriptors: *Nurses, Medical services, Manpower, Education, Questionnaires, Surveys, Medical personnel, Industrial medicine, Tables(Data).
Identifiers: Licensed practical nurses.

The study used a mailed questionnaire to assess certain characteristics of licensed practical nurses who work in occupational health nursing. The educational status, personal characteristics, nursing practices, and the industrial setting of the LPN in occupational health have been analyzed for use by employers, nurse educators, health planners, and related interest groups.

6F. Environmental Biology

AD-779 800/2GA PC$8.25/MF$1.45
Smithsonian Institution Washington D C
ECOLOGICAL BASELINE SURVEY OF JOHNSTON ATOLL, CENTRAL PACIFIC OCEAN,
A. Binion Amerson, Jr. 17 Dec 73, 383p AFOSR-TR-74-0788
Contract F44620-67-C-0063

Descriptors: *Ecology, *Johnston Island, Pacific Ocean, Animals, Plants(Botany), Abundance, Distribution, Invertebrates, Vertebrates, Oceanographic data, Climate, Marine geology, History, Surveys.
Identifiers: *Sand Island, *Biological surveys.

A comprehensive survey of existing information on the fauna and flora of Johnston and Sand Islands in the central Pacific Ocean is presented. This is based on nine years of biological and ecological data collected by the Smithsonian Institution and other organizations. Extensive files of raw data on biology, published and unpublished reports, and assistance of many individuals contributed to the report. Information is also included on the history, geology, climate, water movement, and changes caused by human intervention. This report presents baseline data on the plant and animal species with their distribution, abundance, and variation in population sizes for the years data are available. The report forms the basis for an Environmental Impact Statement preparatory to proposed actions which could produce ecological effects. (Modified author abstract)

AD-779 875/4GA PC$3.00/MF$1.45
Johns Hopkins Univ Baltimore Md Chesapeake Bay Inst
DIFFUSION-INDUCED INSTABILITY IN MODEL ECOSYSTEMS: ANOTHER POSSIBLE EXPLANATION OF PATCHINESS.
Technical rept.,
Akira Okubo. May 74, 23p Rept nos. Ref-74-3, TR-86
Contract N00014-67-A-0163-0006, Grant NSF-GI-38973

Descriptors: *Aquatic organisms, Mathematical models, Simulation, Ecology, Naval research, Stability, Instability, Diffusion, Population, Distribution.
Identifiers: *Ecosystems.

As a diffusion process in an ecosystem tends to give rise to a uniform density of population in space, it may be expected that diffusion plays a general role of increasing the stability in a system of mixed populations and resources. However, diffusion may also induce an instability to a system which is basically stable without diffusion. Thus a system of two interacting and diffusing populations both being co-existent in a spatially uniform distribuiton, hence with no patterns, may exhibit an interaction-diffusion instability. The instability results in a form of biological waves in space and time, thus leading to a 'patchiness.' (Author)

AD-780 050/1GA PC$3.25/MF$1.45
Federal Aviation Administration Washington D C Systems Research and Development Service
THE RESPONSE OF SONGBIRDS TO THE SEISMIC COMPRESSION WAVES PRECEDING SONIC BOOMS.
Final rept.,
Thomas H. Higgins. May 74, 28p Rept no. FAA-RD-74-78

Descriptors: *Birds, *Sonic boom, *Seismic waves, Wildlife, Response(Biology), Audio tapes, Test methods, Test equipment, Recording systems, Sound, Supersonic aircraft, Jet plane noise.
Identifiers: *Animal behavior, Noise pollution.

Among the environmental and operational problems studied during the program were the effects of the sonic booms on wildlife. In addition to the customary sonic boom overpressure signature measurements, audio tape recordings were made at both outdoor and indoor measurement sites and these were studied in realtion to the other measures obtained. Analysis of the audio tapes disclosed an interesting phenomena. The continuous songs of birds of the field were completely silenced 4 to 8 seconds prior to the arrival of the audible sonic boom. Additional audio recordings, made for the specific purpose of verifying this complete silence of all songbirds 4 to 8 seconds

prior to the arrival of the sonic boom's audible report and overpressure signature measurement, were identical to the first obtained. Further study disclosed that this response of songbirds coincides with the arrival of the seismic signal propagated through the ground and preceding the sonic boom shock wave by 4 to 8 seconds. (Modified author abstract)

AD-780 117/8GA PC$3.75/MF$1.45
Stanford Research Inst Menlo Park Calif
DEVELOPMENT OF MOSQUITO REPELLENTS HAVING INCREASED PROTECTION TIME IN MAN.
Annual rept. 1 Jul 73-15 Mar 74,
W. A. Skinner, Howard L. Johnson, and H. C. Tong. 15 Mar 74, 66p
Contract DADA17-70-C-0112

Descriptors: *Culicidae, *Insect repellents, Ethers, Behavior, Humans, Protection, Glycols, Thiazoles, Quinolines, Sulfonamides, Toxicology, Humans.
Identifiers: *Mosquitoes, Aedes aegypti, Quinoxalines, Thiazolidinones, Polyethers.

Synthetic topical repellents were prepared, following previously reported leads that resulted from intrinsic repellency studies and from Stanford Research Institute (SRI) computed-coded USDA compounds. The most promising structural area for topical repellency continues to be glycol ether derivatives, although the carbamide, 2,4-thiazolidinedione, and quinoxaline areas are also of interest. Efforts were directed toward polymer formulations of SRI glycol ethers to improve their wash-off characteristics and cosmetic acceptability. These studies range from the typical film-formers to carbowax stick-type formulations. Large samples of two 2,4-thiazolidinediones were synthesized for toxicologic evaluation. (Modified author abstract)

AD-780 466/9GA PC$3.00/MF$1.45
Arizona Univ Tucson Dept of Entomology
BIONOMICS OF MOSQUITOES IN SEMI-ARID URBAN AREAS.
Final rept. 1 Jul 73-30 Jun 74,
John L. McDonald. 15 Jun 74, 14p
Contract N00014-74-C-0017

Descriptors: *Culicidae, *Arizona, *Insect control, Bites and stings, Disease vectors, Encephalitis, Deserts, Arid land, Urban areas.
Identifiers: Psorophora signipennis, Psorophora confinnis, Aedes vexans.

Incidence of biting mosquitoes in the semi-arid urban areas, as represented by Tucson, Arizona, is a function of temperature and rainfall. Eight species of mosquitoes were collected during the year but biting mosquito problems were only associated with three species: Psorophora signipennis, P. confinnis and Aedes vexans. Significant mosquito control was realized using mosquito fish (Gambusia affinis) alone and/or in combination with Flit MLO and Dursban. (Author)

AD-780 517/9GA PC$4.75/MF$1.45
Air Force Armament Lab Eglin AFB Fla
ECOLOGICAL STUDIES ON A HERBICIDE-EQUIPMENT TEST AREA (TA C-52A), ELGIN AFB RESERVATION, FLORIDA.
Final rept. Jan 67-Nov 73,
Alvin L. Young. Jan 74, 141p Rept no. AFATL-TR-74-12

Descriptors: *Herbicides, *Ecology, Drainage, Soils, Degradation, Plants(Botany), Animals, Microorganisms, Test facilities.
Identifiers: Pesticide residues.

The report attempts to answer the major questions concerned with the ecological consequences of applying massive quantities of herbicides (346,117 pounds), via repetitive applications, over a period of eight years, 1962 - 1970, to an area of approximately one square mile. Moreover, the report documents the persistence, degradation, and/or disappearance of the herbicides from the Test Area's soils and drainage waters and their subsequent effects (direct or indirect) upon the vegetative, faunal, and microbial communities. The active ingredients of the four military herbicides (Orange, Purple, White, and Blue) sprayed on Test Area C-52A were 2,4-dichlorophenoxyacetic acid (2,4-D), 2,4,5-trichlorophenoxyacetic acid (2,4,5-T), 4-amino-3,5,6-trichloropicolinic acid (picloram), and dimethylarsinic acid (cacodylic acid). (Modified author abstract)

AECL-3956 PC$6.00/MF$1.45
Atomic Energy of Canada LTD., Pinawa, Manitoba. Whiteshell Nuclear Research Establishment.
HABITATS OF SMALL MAMMALS AT WHITESHELL NUCLEAR RESEARCH ESTABLISHMENT.
S. L. Iverson, and B. N. Turner. Dec 73, 58p

Descriptors: (*Canada, *Ecology), (*Mammals, *Distribution), Conifers, Environment, Forests, Herbs, Reactor sites, Sampling, Shrubs, Trees, Wr-1 reactor.

For abstract, see NSA 29 12, number 29395.

CEA-CONF-2517 PC$3.00/MF$1.45
Institut National de la Sante et de la Recherche Medicale (Inserm), 06 - Nice (France). Centre d'Etudes et de Recherches Medicales de Biologie et d'Oceanographie Medicale (Cerbom).
EXPERIMENTAL INVESTIGATIONS, AT LABORATORY, ON THE TRANSFER OF MERCURY IN MARINE TROPHIC CHAINS.
F. Laumond, M. Neuburger, B. Donnier, A. Fourcy, and R. Bittel. 1973, 6p CONF-730995-1

Descriptors: Aquatic ecosystems, Diffusion, Fishes, Food chains, Mercury, Molluscs, Plankton, Seas, Seawater.

For abstract, see NSA 29 12, number 31629.

COM-74-11057/8GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
SEWAGE EFFECTS IN MARINE AND ESTUARINE ENVIRONMENTS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1974-May 74,
Edward J. Lehmann. Jun 74, 117p* NTIS-WIN-74-047

Descriptors: *Bibliographies, *Sewage, *Water pollution, *Sludge, *Aquatic biology, Oceans, Ecology, Aquatic biology, Sewage disposal, Sludge disposal, Estuaries, Water quality, Benthos.
Identifiers: *Water pollution effects(Animals), *Water pollution effects(Plants), *Ocean waste disposal.

The bibliography contains 112 selected abstracts of research reports retrieved using the NTIS on-line search system - NTISearch. The topics cover the effects that sewage effluents and sludge have upon marine and estuarine environments especially on their ecology. Included are reports dealing with the effects on marine plants and animals, problems due to ocean dumping, dispersion studies, water chemistry, and other related topics.

COM-74-11091/7GA Reprint
Wisconsin Univ., Madison. Sea Grant Program.
FIELD STUDIES ON PHOTOSYNTHESIS OF 'CLADOPHORA GLOMERATA' (CHLOROPHYTA) IN GREEN BAY, LAKE MICHIGAN,
Michael S. Adams, and Walter Stone. 1973, 13p
WIS-SG-74-342 NOAA-74051603
Pub. in Ecology, v54 n4 p853-862 Summer 73.

Descriptors: *Chlorophyta, *Photosynthesis, *Algae, *Green Bay, Lake Michigan, Aquatic plants, Nutrients, Wisconsin, Ecology, Nitrogen, Calcium, Strontium, Sodium, Zinc, Sunlight, Temperature.
Identifiers: Sea Grant program, *Cladophora glomerata, *Eutrophication.

Net photosynthesis of Cladophora glomerata was measured at three sites in lower Green Bay, Lake Michigan, from late spring through summer, 1971. Lower levels of productivity occurred early in the season at two of the sites, when water temperatures were lowest. At the third site water temperature and productivity varied the least. Contrary to other reports, it was found that Cladophora made relatively efficient use of low illumination. Under statistically similar temperature and irradiance levels, productivity was higher with increasing proximity to the mouth of the Fox River. Nitrogen, calcium, strontium, sodium, and zinc also were highest in concentration in plants receiving the greatest amount of effluents from the Fox River in comparison with the site receiving the least. Site differences in productivity appear to be related to nutrient levels, whereas seasonal differences in productivity are probably most closely related to seasonal temperature differences.

ORNL-NSF-EATC-6 PC$24.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ECOLOGY AND ANALYSIS OF TRACE CONTAMINANTS. PROGRESS REPORT, JANUARY 1973--SEPTEMBER 1973.
W. Fulkerson, W. D. Shults, and R. I. Van Hook. Jan 74, 438p
Contract W-7405-eng-26

Descriptors: (*Ecology, *Research programs), (*Environment, *Pollution), Aquatic ecosystems, Electrochemistry, Food chains, Gas chromatography, Hydrology, Information retrieval, Information systems, Liquid wastes, Multi-element analysis, Oral, Solvent extraction, Terrestrial ecosystems, Trace amounts, X-ray fluorescence analysis.

For abstract, see NSA 29 12, number 31635.

PB-232 988/6GA PC-GPO/MF$1.45-NTIS
Oregon State Univ., Corvallis. Dept. of Microbiology.
EFFECTS OF TEMPERATURE ON DISEASES OF SALMONID FISHES.
Ecological research series,
J. L. Fryer, and K. S. Pilcher. Jan 74, 119p* EPA-660.3-73-020
Paper copy available from GPO $1.55 as EP1.23:660/3-73-020.

Descriptors: *Infectious diseases, *Salmon, *Trout, Fishes, Pathology, Mortality, Experimental data, Temperature, Animal diseases, Microbiology, Effluents.
Identifiers: *Thermal pollution, Water pollution effects(Animals), Chondrococcus columnaris, Aeromonas salmonicida, Aeromonas liquefaciens, Ceratomyxa shasta.

The effect of water temperature on infections of salmonid fish was investigated. Chondrococcus columnaris infection was studied in rainbow trout, coho and spring chinook salmon, Aeromonas salmonicida infection in coho and spring chinook salmon; and Aeromonas liquefaciens infection in steelhead trout. In all cases mortality rates were high at 64 to 69F; moderate at 54 to 59F; and low or zero at 39 to 49F. Progress of the infections was accelerated at higher temperatures, and progressively retarded at decreasing temperature levels. In infection of coho with Ceratomyxa shasta, mortality was high at 69F, low at 49 to 54F, and zero at 39 to 44F. This infection in rainbow trout resulted in high mortality at all temperatures except 39F. In both cases the course of the disease was most rapid at higher temperatures, and became progressively slower as the temperature decreased. For infection of kokanee salmon fingerlings with

sockeye salmon virus, the temperature range of 54 to 59F was optimal.

6G. Escape, Rescue, and Survival

AD-780 058/4GA PC$3.00/MF$1.45
Naval Submarine Medical Research Lab Groton Conn
HUMAN FACTORS EVALUATION OF SUBMARINE ESCAPE. V. DISCONNECT TIME WITH FOUR COMBINATIONS OF THE SCHRADER QUICK DISCONNECT AIR FITTING.
Interim rept.,
Gary B. Walters, and Bernard L. Ryack. 12 Sep 73, 24p Rept no. NSMRL-753
See also report AD-775 681.

Descriptors: *Submarine escape, *Hose fittings, *Disconnect fittings, *Human factors engineering, Quick reaction, Performance(Human), Hoses, Hose couplings, Analysis of variance.
Identifiers: EASE(Escape And Survival Equipment), Escape and survival equipment, *Quick disconnect fittings.

Utilizing a simulated escape and survival equipment appliance, four arrangement of the standard Schrader quick-disconnect air fitting and two escape trunk hose positions, fixed and floating, were evaluated with respect to speed and reliability of disconnect in a dry environment. The results indicated that the most desirable arrangement of the Schrader connector is one in which the female part of the connector is attached at a 90 degree angle with respect to the charging hose of the EASE, while the male connector is attached at a 0 degree angle with respect to the air hose in the escape trunk. Hose position was not significant for this arrangement. Since the connector is intended to be used in a wet environment, and this research was performed in a dry environment, it is recommended that the study be repeated in a wet environment before final conclusions are drawn. (Author)

6H. Food

CEA-CONF-2480 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Cadarache, 13 - Saint-Paul-les-Durance (France).
INFLUENCE OF GAMMA IRRADIATION ON THE HEALTHFULNESS AND TECHNOLOGICAL PROPERTIES OF CORN STARCH.
L. Saint-Lebe, G. Berger, and A. Mucchielli. 1973, 12p CONF-730684-1
In French.

Descriptors: (*Starch, *Radiosterilization), Chemical radiation effects, Gamma radiation, Maize, Organoleptic properties, Radiation doses, Radiopreservation, Storage life.

For abstract, see NSA 29 12, number 29678.

COM-74-11090/9GA Reprint
California Univ., Davis.
REACTION OF HYDROGEN PEROXIDE WITH MYOGLOBINS,
K. S. Morey, Stephen P. Hansen, and W. Duane Brown. 18 Jul 73, 6p NOAA-74042909
Contract NOAA-2-35208
Revision of report dated 9 Apr 73.
Pub. in Jnl. of Food Science, v38 p1104-1107 1973.

Descriptors: *Seafood, Myoglobin, *Hydrogen peroxide, *Food processing, Ethylamine, Blood proteins, Discoloration, Organic pigments, Tunas, Cysteine.
Identifiers: Sea Grant program, Dithionites.

The experiments reported were done to study the changes in color and spectra that occur during the interaction of H2O2 with tuna or sperm whale myoglobins in native and denatured states. The effects of cysteine and homocysteine on the intensity of green color produced by H2O2 were studied in order to compare this form of greening to the one produced by trimethylamine (TMAO). The effect of the reducing agent dithionite on the green color and spectra of myoglobins was also studied. The results suggest that neither cysteine nor homocysteine are involved in greening associated with H2O2. The green pigment formed by the reaction of myoglobin with H2O2 is spectrally different from the pigment obtained by heating a mixture of tuna myoglobin, cysteine and TMAO. TMAO and cysteine could form a green pigment with yellowfin tuna but not with sperm whale myoglobin apparently because the latter does not have cysteine residues. On the other hand, the H2O2 reaction can produce green pigments with myoglobins from both sources.

EURISOTOP-83 PC$8.50/MF$1.45
Commission of the European Communities, Brussels (Belgium). Bureau Eurisotop.
TECHNOLOGY OF THE RADIO-INHIBITION OF THE GERMINATION OF POTATOES. REPORT ON THE SEMI-INDUSTRIAL SCALE TESTS, 1970--71 AND 1971--72 SEASONS.
F. Sandret. 1973, 106p
In French.

Descriptors: (*Potatoes, Radiopreservation), (*Radiopreservation, *Legal aspects), Belgium, Chemical composition, France, German federal republic, Germination, Italy, Netherlands, Sprout inhibition, Storage life, Weight.

For abstract, see NSA 29 12, number 29648.

PATENT-3 243 301 Not available NTIS
Department of Agriculture, Washington, D.C.
CEREAL-CONTAINING VARIETIES OF TEMPEH AND PROCESS THEREFOR.
Patent, *Filed 3 Apr 64, Patented 29 Mar 66,
Clifford W. Hesseltine, and Mabel L. Smith. 29 Mar 66, 3p PAT-APPL-357 330,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Grains(Food), *Food processing, *Patents, Fermentation, Mixtures, Fungi, Wheat, Cereal products, Soybeans.
Identifiers: PAT-CL-99-80, Tempeh, Rhizopus oligosporus.

The invention relates to novel varieties of the Indonesion highly molded soybean food called tempeh, and to the process for making the novel varieties. More specifically, this invention relates to the preparation of novel varieties of tempeh not exclusively from soybeans as in the prior art but more particularly by subjecting exclusively either a pretreated cereal grain substrate such as wheat, rye, oats, rice, or barley or a substrate comprising an intimate mixture of a said cereal grain and soybean grits to the action of the mold Rhizopus oligosporus.

PATENT-3 391 089 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR DETOXIFYING AND DEBITTERING THE SEEDS OF 'CRAMBE ABYSSINICA'.
Patent, *Filed 4 Aug 65, patented 2 Jul 68,
Gus C. Mustakas, and Larry D. Kirk. 2 Jul 68, 3p PAT-APPL-502 718,
Continuation-in-part of application no. 477 332, 4 Aug 65.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Seeds, *Detoxification, *Patents, Sodium hydroxide, Sodium carbonates.
Identifiers: PAT-CL-99-2, Crambe abyssinica.

The patent discloses process for detoxifying and debittering Crambe abyssinica meal comprising: heating said meal to a myrosinase-inactivating temperature of at least 180F, then adding powdered sodium carbonate or sodium hydroxide, heating reactants to about 220-230F with direct steam, partially drying the product with indirect heat, and then discharging the product.

PATENT-3 392 026 Not available NTIS
Department of Agriculture, Washington, D.C.
AMMONIATION PROCESS FOR DETOXIFYING THE SEEDS OF 'CRAMBE ABYSSINICA' AND RAPE.
Patent, *Filed 4 Aug 65, patented 9 Jul 68,
Gus C. Mustakas, and Larry D. Kirk. 9 Jul 68, 3p PAT-APPL-477 332,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Seeds, *Detoxification, *Patents, Ammonia.
Identifiers: PAT-CL-99-2, Crambe abyssinica, Brassica napus.

The patent discloses a process for debittering and detoxifying thioglucoside-containing seeds such as Crambe abyssinica and Brassica (rape) comprising: steaming the seed material at 200-215F to inactivate enzymes, contacting the seed material with reactants ammonia gas and aqueous ammonium hydroxide, subjecting the ammoniated seed material to live steam and finally drying under reduced pressure.

PATENT-3 522 056 Not available NTIS
Department of Agriculture, Washington, D.C.
REDUCTION OF STRONTIUM-90 CONTENT OF INTACT CEREAL GRAINS.
Patent, *Filed 6 Aug 65, patented 28 Jul 70,
Virgil F. Pfiefer, and Roy A. Anderson. 28 Jul 70, 2p PAT-APPL-477 983,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Grains(Foods), *Chemical cleaning, *Strontium 90, *Patents, Removal, Cesium 137, Citric acid, Phosphoric acids.
Identifiers: PAT-CL-99-80.

The invention relates to a process for removing most of the dangerously high amounts of strontium-90 that are found to be systematically present in intact cereal grains. Systemic incorporations of strontium-90 in unmilled cereal grain berries are lowered to negligible levels without attrition and without impairment of fractions in a subsequent milling thereof by washing the intact berries for several hours in a warmed dilute aqueous solution of citric acid or of phosphoric acid.

PATENT-3 679 433 Not available NTIS
Department of Agriculture, Washington, D.C.
PROTEIN-ENRICHED BAKED PRODUCTS AND METHOD OF MAKING SAME.
Patent, *Filed 8 Sep 70, patented 25 Jul 72,
Yeshajahu Pomeranz, and Karl F. Finney. 25 Jul 72, 3p PAT-APPL-70 490,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Bakery products, *Food additives, *Patents, Proteins, Soybeans, Cost control, Quality, Flavor, Diets.
Identifiers: PAT-CL-99-90-HP, Soy protein concentrates.

The invention relates to the production of protein-enriched breads and other related baked products of the yeast-leavened type. More specifically, it relates to protein-enriched baked products having improved properties. Increasing the protein content of food products has become an important priority of the food industry. Adding up to 1% soy flour to dough formulations can reduce oxidation requirements and improve the overall qualities of bread.

RISO-260 PC$3.00/MF$1.45
Danish Atomic Energy Commission, Risoe. Research Establishment.
COMPARISON OF THE BIOLOGICAL EFFECTS IN RATS OF RADIATION STERILIZED AND AUTOCLAVE STERILIZED FOOD.
W. H. Eriksen, W. Hjarde, H. Lieck, A. Juul, and C. Emborg. Jun 73, 15p

Descriptors: (*Food, *Radiosterilization), (*Rats, *Diet), Abscopal radiation effects, Autoclaves, Biological effects, Growth, Mutations, Reproduction, Sterilization.

For abstract, see NSA 29 12, number 29680.

TT-73-54049 PC$3.00
Department of Agriculture, Washington, D.C.
THE QUALITY OF CACAO OIL FROM THE BRAZILIAN AND AFRICAN BEAN: A COMPARATIVE STUDY (POROWNANIE JAKOSCI TLUSZCZU KAKAOWEGO Z ZIARNA BRAZYLIJSKIEGO I AFRYKANSKIEGO),
C. Pietrzyk, and A. Warzecha. 1974, 8p
Trans. of Tluszcze Jadalne (Poland) v14 n3 p113-119 1970, by M. Jurecki. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Oils, *Cacao trees, *Food storage, Quality, Oxidation, Deterioration, Correlation techniques, Color, Taste, Odors, Brazil, Africa, Translations, Poland.
Identifiers: *Cacao oil.

The cacao oil is employed in food, pharmaceutical and cosmetic industries. It is either imported to Poland or obtained by pressing the cacao pulp made of sorted out and cleaned bean. The class of bean, conditions of its harvest and storage and process of separation are responsible for the stability and quality of the cacao oil. Oxidation processes not only have a bad effect on organoleptic features but may reduce, as well, the nutrition value of the oil. A comparison was made between cacao oil imported from Brazil and that produced in Poland from the African bean.

TT-73-54065 PC$3.00
Department of Agriculture, Washington, D.C.
THE NUTRITIVE VALUE OF POWDERED SOUPS (WARTOSC ODZYWCZA KONCENTRATOW ZUP),
L. Szczepanski, J. Graczyk, and H. Marczuk. 1974, 9p
Trans. of Roczniki Panstwowego Zakladu Higieny (Poland) v18 n3 p373-378 1967, by A. Skup. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Dried foods, *Nutritive value, Powders, Human nutrition, Vegetables, Proteins, Iron, Calcium, Translations, Poland.
Identifiers: Powdered soups.

A study was made on the question to what an extent the nutritional constituents of powdered soups meet the daily human requirement. Pea soup was found to provide the highest amount of proteins and phosphorus compounds, whereas largest quantities of fat are contained in the mushroom soup of the five sorts of powdered soups examined. The powdered red beet soup proved to be a rich source of calcium. All of the soups investigated turned out to cover the daily requirement for iron.

6I. Hygiene and Sanitation

PATENT-3 287 223 Not available NTIS
Department of Agriculture, Washington, D.C.
NONSTICKY ALUMINUM-CONTAINING ANTIPERSPIRANT.
Patent, *Filed 10 Mar 64, patented 22 Nov 66, Fred C. Theile, and Peter Sgaramella. 22 Nov 66, 2p PAT-APPL 350 925,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Cycloaliphatic alcohols, *Aluminum hydroxides, Additives, Adhesion, Monohydric alcohols.
Identifiers: PAT-CL-167-90, *Antiperspirants.

The invention relates to aluminum-containing antiperspirant compositions also comprising a minor proportion of a novel C18 or C20 saturated cyclic monohydric alcohol. These novel alcohols prevent the objectionable sensation of clamminess or tackiness that usually accompanies or follows the application of an aluminum-containing antiperspirant to the axillary areas of the body.

PATENT-3 414 515 Not available NTIS
Department of Agriculture, Washington, D.C.
COLOR IMPARTING COMPLEXES OF STARCH ETHERS FOR SWIMMING POOLS.
Patent, *Filed 5 Oct 64, patented 3 Dec 68, Charles L. Mehltretter, and William B. Roth. 3 Dec 68, 3p PAT-APPL-401 744,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Swimming pools, *Disinfectants, *Amyloses, *Iodine organic compounds, Starches, Complex compounds, Coloring, Ethers.
Identifiers: PAT-CL-210-62.

The patent concerns the disinfection of Swimming pools with nonirritant iodine instead of chlorine. At the same time pools can be given a stable, highly attractive green to blue coloration that maskes the expected yellow tint of the uncomplexed excess iodine by using in lieu of chlorine the deeply blue iodine complex of a hydroxyalkyl ether of amulose and of amylose-containing starches.

6J. Industrial (Occupational) Medicine

AD-779 833/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
HYGIENIC CHARACTERISTICS OF NOISE AT MODERN THERMAL POWER STATIONS,
Yu. P. Paltsev. 18 Apr 74, 12p Rept no. FTD-HT-23-1031-74
Edited trans. from Nauchno-Issledovatelskii Institut Gigieny, Moscow. Uchenye Zapiskii (USSR) p56-62 1968, by Frank C. Vaughan.

Descriptors: *Thermal power plants, *Noise(Sound), *Industrial hygiene, Acoustic measurement, Performance(Human), Deafness, USSR, Translations, Protection, Personnel, Industrial medicine.
Identifiers: Recommendations, Noise pollution, Noise reduction.

The maintenance personnel of thermal power stations are exposed to the constant effect of noise, whose total level reaches 100-111 dB, for the whole work day. The noise levels can be lowered both at operating and planned thermal power stations due to the elimination or sound proofing of its sources. For the protection of the maintenance personnel of the power station from the adverse effect of noise in turbine and boiler shops, it is necessary to install noise insulating booths in the operator's positions and to cover the walls of the rooms of unit control panels with sound insulating panels. It is recommended that antihum devices be used during work in sections with intense noise (near air holes of steam pipelines).

AD-780 335/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
OCCUPATIONAL DISEASES OF THE SKIN AND RESPIRATORY ORGANS IN PERSONNEL WORKING IN THE PRODUCTION OF CERTAIN MEDICATIONS,
A. N. Alenina, I. F. Nikonets, I. S. Ivanova, and Yu. L. Makarenko. 24 May 74, 9p Rept no. FTD-HT-23-1295-74
Edited trans. of Klinicheskaya Meditsina (USSR) v48 n3 p99-101 Mar 70, by Dean F. W. Koolbeck.

Descriptors: *Occupational diseases, *Pharmacology, Allergic diseases, Respiratory diseases, Skin diseases, Drugs, production, Industrial medicine, Dust, Industrial hygiene, USSR, Translations.

Occupational allergic diseases of the upper respiratory tract and of the skin in the chemicopharmaceutical industry have been observed in workers engaged in the production of antibiotics, vitamins, sarcolysin, caffeine, novocaine, acrichin, and many other preparations. According to data, occupational diseases - eczema and bronchial asthma - were noted in 3% of the workers in a plant for antibiotic production. The possible development of occupational diseases of the skin at establishments engaged in producing alkaloids of the morphine group has also been reported. A correlation of these diseases with personnel in the drug industry is discussed.

AD-780 369/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
IMPAIRMENT OF THE HEARING FUNCTION IN PISTOL TESTER-ASSEMBLERS,
P. S. Kublanova. 23 Apr 74, 11p Rept no. FTD-HT-23-1035-74
Edited trans. from Nauchno-Issledovatelskii Institut Gigieny, Moscow. Uchenye Zapiskii (USSR) p86-91 1968, by Ray E. Zarza.

Descriptors: *Pistols, *hearing, *Noise, Deafness, Small arms, Test methods, Industrial medicine, USSR, Translations, Protective equipment.
Identifiers: Hearing conservation.

The state of the acoustic function in 31 pistol tester-assemblers was studied. Their ages were from 25 to 45 years, period of service from one month to 2.5 years. For the workers subjected to prolonged action of industrial noise and vibrations, several types of audiograms were encountered that reflect different stages of the development of occupational deafness. The limited suppression of hearing can be represented in the form of a curve with a trough at 4000 Hz; earlier impairment persists over a relatively long period, and then slowly and to a less marked degree, covers 3000 Hz, 2000 Hz and lower frequencies. For those workers with a considerable degree of hearing impairment at 4000 Hz and higher, it was observed that with a relatively greater period of industrial service, there was retention of the normal perception of the lower sounds.

AD-780 393/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
COMPARATIVE HYGIENIC NOISE AND VIBRATION EVALUATION OF POWER EXCAVATING SHOVELS IN THE SIBAISKII AND LEBEDINSKII PITS,
N. A. Ryabov. 24 May 74, 15p Rept no. FTD-HT-23-1032-74
Edited trans. from Nauchno-Issledovatelskii Institut Gigieny, Moscow. Uchenye Zapiskii (USSR) p63-70 1968, by Joseph E. Pearson.

Descriptors: *Industrial hygiene, *Machinery noise, *Vibration, *Stress(Physiology), Industrial medicine, Mining engineering, Mineralogy, Shovels, Operators(Personnel), USSR, Translations.

On shovels of one and the same brands, vibration and noise were more strongly expressed at the Sibayskiy pit than at the Lebedinskiy pit; this was connected with the different properties of the rocks being extracted and the diverse degree of the state of wear of the mechanisms of the shovels. The changes in physiological functions of the operators toward the end of the work day (the increase in arterial pressure, the increase in the latent time of auditory motor and visual motor reaction, the increase in the thresholds of pain sensitivity, etc.) attest to the unfavorable effect of the noise and vibration. The shifts in the physiological functions during the course of work, as well as the vibrations in health detected during the medical examination of workers were more pronounced in the operators of the Sibayskiy pit than in the operators of the Lebedinskiy pit, and depended, apparently, on the working conditions and, primarily, on the noise levels and the vibrational parameters, affecting the workers.

PB-232 562/9GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. UNIVERSAL OIL PRODUCTS, NORPLEX DIVISION, FRANKLIN, INDIANA.
Final rept. Nov 72-May 73,
Henry Ramos, and James B. Lucas. Oct 73, 8p NIOSH-TR-086-74, HHE-72-82-86

Descriptors: *Hazardous materials, *Industrial medicine, *Solvents, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Organic solvents, Acetone, Methyl ethyl ketone, Toluene, Vapors.
Identifiers: *Occupational Safety and Health Act of 1970, Ethanol/methoxy, *Toxic hazards.

In response to a request received from a representative of employees the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to solvents containing acetone, methyl ethyl ketone, toluene and methyl cellosolve in the treater and compounding rooms of Universal Oil Products, Franklin, Indiana. It was determined that the organic vapors were not toxic at the concentrations measured during this evaluation. The determination was based on environmental levels of the various solvents and medical histories.

PB-232 563/7GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. WESTINGHOUSE ELECTRIC CORPORATION, BLOOMFIELD, NEW JERSEY.
Final rept. Aug 72-Apr 73,
Steven R. Cohen, and Albert A. Maier. Oct 73, 13p NIOSH-TR-087 74, HHE-72-67-87

Descriptors: *Hazardous materials, *Industrial medicine, *Solvents, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Toluene, Epoxy coatings, Dermatitis, Organic solvents, Paints, Vapors.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling, *Toxic hazards.

The National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees conducted a health hazard survey to evaluate exposure to vapors of epoxy-paint used by the Maintenance Paint Crew of Westinghouse Electric Corporation, Bloomfield, New Jersey. It was determined that the concentration of solvent vapors measured during certain periods of normal operating conditions were toxic. Non-volatile components of the epoxy paint products used were not observed to produce toxic effects.

PB-232 564/5GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. GENERAL ELECTRIC COMPANY, INC., MADISONVILLE, KENTUCKY.
Final rept. Jan-May 73,
Henry Ramos, and Steven K. Shama. Oct 73, 10p NIOSH-TR-088-74, HHE-72-107-88

Descriptors: *Hazardous materials, *Industrial medicine, *Naphthas, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Ballast tanks, Petroleum products, Vapors, Skin(Anatomy).
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling, *Toxic hazards.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees to evaluate exposure to petroleum distillate (naphtha) used in removing coal pitch from ballasts in the Final Assembly Section of General Electric Company, Inc., Madisonville, Kentucky. It was determined that petroleum naphtha was toxic at concentrations found in the work environment at the time of the environmental-medical evaluation.

PB-232 565/2GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. KING SEELEY THERMOS COMPANY, MACOMB, ILLINOIS.
Final rept. Apr-Jun 73,
Robert Vandervort, and Steven K. Shama. Nov 73, 18p NIOSH-TR-090-74, HHE-73-30-90

Descriptors: *Hazardous materials, *Industrial medicine, *Toluene, *Isocyanates, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Insulation, Polyurethane resins, Diisocyanates.
Identifiers: *Occupational Safety and Health Act of 1970, Toxic hazards.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate toluene diisocyanate (TDI) found in polyurethane foam materials used at King Seeley Thermos Company, Macomb, Illinois. It was determined that exposure to toluene diisocyanate in this plant was potentially toxic to sensitive employees. It was not positively established how sensitive employees acquired their sensitivity to TDI. Although past exposures to transient high levels of TDI due to spills of foam materials were considered an important cause of sensitivity, sensitivity in some cases may have resulted from chronic exposures to low levels of TDI. Recommendations were made to management regarding medical monitoring programs, engineering control, employee protective equipment, and work practices.

PB-232 566/0GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. STRUM MACHINE CO., INC., BARBOURSVILLE, WEST VIRGINIA.
Final rept.,
Albert A. Maier, Kenyon Rupnik, and Phillip L. Polakoff. Nov 73, 15p NIOSH-TR-093-74, HHE-72-92-93

Descriptors: *Hazardous materials, *Industrial medicine, *Fumes, *Metals, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Machine tool industry, Antimony, Boron, Cadmium, Cobalt, Chromium, Iron, Nickel, Manganese.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

In response to a request received from an employer, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to determine exposure to toxic metal fumes at the Sturm Machine Co, Inc., Barboursville, West Virginia. Based upon environmental-medical investigations, it has been determined that antimony, boron, cadmium, cobalt, chromium, iron, nickel, manganese, silicon as well as carbon monoxide, oxides of nitrogen and ozone have produced toxic effects in employees in the past. At the concentrations measured during this evaluation these substances are judged to be potentially toxic to employees due to the persistence of mild symptomology and the potential for enhanced toxicity of substances found in combination.

PB-232 567/8GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. COLORADO BRICK COMPANY, BOULDER, COLORADO.
Final rept.,
Bobby J. Gunter. Nov 73, 8p NIOSH-TR-092-74, HHE-73-59-92

Descriptors: *Hazardous materials, *Industrial medicine, *Silicon dioxide, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Carbon monoxide, Lead(Metal), Chromium, Manganese, Iron, Brick industry.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling, *Toxic hazards.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to determine exposure to free silica, nuisance dust, lead, manganese, chromium, iron, and carbon monoxide at the Colorado Brick Co., Boulder, Colorado. Based on environmental data, it was determined that respirable free silica was toxic at the concentrations found, and that all other substances evaluated were not toxic.

PB-232 568/6GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. HANFORD FOUNDRY, SAN BERNARDINO, CALIFORNIA.
Final rept.,
Lee B. Larsen. Nov 73, 10p NIOSH-TR-094-74, HHE-73-130-94

Descriptors: *Hazardous materials, *Industrial medicine, *Chromium, *Nickel oxides, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Cadmium, Fluorides, Castings.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees to determine exposure to welding gases and fumes at the Hanford Foundry, San Bernardino, California. It was determined that no health hazard exists from exposure to welding exhaust gases. However, a potential health hazard was considered to exist from exposure to welding fumes of alloys containing a high percentage of chromium and nickel. It was recommended that local exhaust ventilation be provided for each welding booth to prevent irritation of the upper respiratory tract during welding with fluoride fluxes, and to control cadmium, chromium and nickel oxide fumes.

PB-232 569/4GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. INTERNATIONAL WIRE WORKS, MENASHA, WISCONSIN.
Final rept.,

David J. Burton. Nov 73, 4p NIOSH-TR-095-74, HHE-73-64-95

Descriptors: *Hazardous materials, *Industrial medicine, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Wire processing.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate the potential hazards of exposure to Product A2 in the Finishing Department of International Wire Works, Menasha, Wisconsin. It was determined that Product A2, as used and found, is not toxic to employees. This determination is based upon lack of employee complaints, lack of evident adverse reactions, relatively low toxicity of Product A2, and its sporadic use which limits exposure.

PB-232 573/6GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. BAKAN PLASTICS COMPANY, LEE'S SUMMIT, MISSOURI.
Final rept.,
George J. Butler. Oct 73, 6p NIOSH-TR-079-74, HHE-73-10-79

Descriptors: *Hazardous materials, *Industrial medicine, *Formaldehyde, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Injection molding, Plastics.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to formaldehyde which is produced from certain resinous material used in manufacture of plastic parts by injection molding at Bakan Plastics Company, Lee's Summit, Missouri. It was determined through environmental evaluation, employee interviews, and professional judgement, that no health hazard existed from exposure to formaldehyde associated with this process.

PB-232 574/4GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. AIRCO VACUUM METALS COMPANY, BERKELEY, CALIFORNIA.
Final rept.,
Melvin T. Okawa. Oct 73, 4p NIOSH-TR-080-74, HHE-73-20-80

Descriptors: *Hazardous materials, *Industrial medicine, *Vermiculite, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Metal working, Stainless steels.
Identifiers: *Occupational Safety and Health Act of 1970, *Basolite, *Toxic hazards.

In response to a request received from a representative of employees, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to vermiculite dust and basolite powder at the Airco Vacuum Metals Company, Berkeley, California. It was determined that vermiculite and basolite at the concentrations found in the work environment at the time of this evaluation were not toxic. This determination was based upon an analysis of work practices and employee interviews.

PB-232 575/1GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. GALILEO-CAPRI SALAMI, INC., SAN LORENZO, CALIFORNIA.
Final rept.,
Arnold D. Bodner, and Melvin T. Okawa. Oct 73, 6p NIOSH-TR-081-74, HHE-73-62-81

Descriptors: *Hazardous materials, *Industrial medicine, *Food processing, *Fungi, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Meat, Dust, Noise, Respiratory infections.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

In response to a request received from a representative of employees per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to salami dust in the packing area of Galileo-Capri Salami, Inc., San Lorenzo, California. It has been determined through environmental survey and medical interviews that a minor health hazard due to respiratory tract irritation exists from this exposure to mold grown on the outside of salami.

PB-232 576/9GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. THE BOEING COMPANY, HILL AIR FORCE BASE, UTAH.
Final rept.,
George J. Butler, and Arnold H. Bodner. Oct 73, 8p NIOSH-TR-082-74, HHE-73-67-82

Descriptors: *Hazardous materials, *Industrial medicine, *Nitrophenols, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Missile components, Cork.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling, Toxic hazards.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees to evaluate exposure to p-nitrophenol during touch-up and handling of cork impregnated with this substance in the Minuteman Missile Assembly Plant of Boeing Company, Hill Air Force Base, Utah. It was determined through environmental and biological sampling and medical interviews that no health hazard existed from this exposure to p-nitrophenol.

PB-232 577/7GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. TRIPLER ARMY MEDICAL CENTER, HONOLULU, HAWAII.
Final rept.,
Melvin T. Okawa. Oct 73, 5p NIOSH-TR-083-74, HHE-73-76-83

Descriptors: *Hazardous materials, *Industrial medicine, *Sulfamic acids, *Cleaning agents, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to sulfamic acid in CSCO Ice Machine Cleaner used to clean ice machines at Tripler Army Medical Center, Honolulu, Hawaii. Based upon observation of conditions of use of the chemical and known toxicity data, it was determined that sulfamic acid as used in the work environment was not toxic. Recommendations for safe handling of sulfamic acid were made.

PB-232 578/5GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. JOHN MORRELL COMPANY, SIOUX FALLS, SOUTH DAKOTA.
Final rept. Oct 72-Jan 73,
Phillip L. Polakoff, and Robert Vandervort. Oct 73, 15p NIOSH-TR-089-74, HHE-71-29-89

Descriptors: *Hazardous materials, *Industrial medicine, *Polyvinyl chloride, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Packaging, Pyrolysis, Respiratory infections.
Identifiers: *Occupational Safety and Health Act of 1970, Packaging materials, *Meat packing industry, *Toxic hazards, Air pollution effects(Humans).

In response to a request received from a representative of employees, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to thermal decomposition products of polyvinyl chloride meat packaging film at John Morrell Company, Sioux Falls, South Dakota. Based on medical evidence compiled during a limited study of meat wrapping employees it was determined that air contaminants generated by the thermal cutting of polyvinyl chloride packaging films in conjunction with the wrapping of meat are potentially toxic to some meat wrapping employees. Symptoms range from mild eye, nose and throat irritation to more serious respiratory problems for meat wrappers who have an underlying predisposition to respiratory difficulties. Recommendations have been suggested to management regarding preemployment examinations and work practices.

PB-232 579/3GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. ABC-TV STUDIOS, LOS ANGELES, CALIFORNIA.
Final rept.,
David J Burton. Nov 73, 5p NIOSH-TR-096-74, HHE-73-58-96

Descriptors: *Hazardous materials, *Industrial medicine, *Spray painting, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

The National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees, conducted a health hazard survey to determine toxic effects from paint spray operation in the production services building at ABC-TV Studios, Los Angeles, California. It was determined that the potential for toxic effects from paint spray operations is at a minimum as long as existing materials, precautions, and controls are employed. This determination was based upon employee interviews, lack of complaints or adverse symptoms, lack of highly toxic paint constituents, lack of a history of adverse effects from spray operations, and the limited and sporadic exposure of employees.

PB-232 580/1GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. DIESEL EQUIPMENT DIV., GMC, WYOMING, MICHIGAN.
Final rept.,
Richard S. Kramkowski. Dec 73, 5p NIOSH-TR-097-74, HHE-72-122-97

Descriptors: *Hazardous materials, *Industrial medicine, *Exhaust gases, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Diesel engines, Carbon dioxide, Carbon monoxide, Nitrogen dioxide, Sulfur dioxide.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling, *Toxic hazards.

In response to a request received from a representative of employees, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to determine exposure to noxious fumes in four work areas of Diesel Equipment Division, GMC, Wyoming, Michigan. It has been determined that the airborne concentrations of carbon dioxide, carbon monoxide, nitrogen dioxide and sulfur dioxide are not toxic as measured in the work areas. This determination is based upon observation of the work areas and environmental samples collected in these departments.

PB-232 584/3GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. ARTCRAFT COMPANY, LOS ANGELES, CALIFORNIA.
Final rept.,
Melvin T. Okawa, and Arnold Bodner. Dec 73, 6p NIOSH-TR-098-74, HHE-73-134-98

Descriptors: *Hazardous materials, *Industrial medicine, *Paint thinners, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Solvents, Methyl ethyl ketone, Toluene, Butyl acetates, Xylenes.
Identifiers: *Occupational Safety and Health Act of 1970, *Isopropyl alcohols, *Toxic hazards.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey in response to a request received from a representative of employees to determine exposure to paint thinner vapors at the Artcraft Company, Los Angeles, California. It was determined that methyl ethyl ketone, toluene, n-butyl acetate, isopropyl alcohol, and xylene vapors are not toxic at the concentrations measured. The determination was based on environmental levels of solvent vapors, analysis of their use, medical interviews, and available literature on their toxicities.

PB-232 585/8GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. CAREER DEVELOPMENT CENTER, EVALUATION CENTER, FAIRFIELD, ILLINOIS.
Final rept.,
Richard S. Kramkowski, and Thomas F. Bloom. Nov 73, 6p NIOSH-TR-099-74, HHE-73-80-99

Descriptors: *Hazardous materials, *Industrial medicine, *Solvents, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Offset printing, Cleaning agents.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) in response to a request received from an employer to evaluate exposure to blanket wash and roller cleaner used in the offset press operation at the Career Development Center, Fairfield, Illinois. It was determined that the use of the blanket wash and roller cleaner was not toxic as used or found. This determination was based on the frequency of use, observation of the working area, interviews with employees, and chemical data supplied by the manufacturer of the cleaner.

PB-232 586/8GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. WESTERN FOUNDRY COMPANY, TIGARD, OREGON.
Final rept.,
Arvin Apol. Sep 73, 6p NIOSH-TR-085-74, HHE-73-116-85

Descriptors: *Hazardous materials, *Industrial medicine, *Formaldehyde, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Foundry core making, Aldehydes, Alcohols.
Identifiers: *Occupational Safety and Health Act of 1970, Air sampling, *Furfuryl alcohols, *Toxic hazards.

In response to a request received from a representative of employees, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to furfuryl alcohol and formaldehyde at the Western Foundry Company, Tigard, Oregon. It has been determined that no potential toxic effects exist from air concentrations for furfuryl alcohol and formaldehyde found in the working environment under normal operating conditions, the day the determination was made. This determination was based on the environmental levels, employee response, visual observations and employee interviews.

PB-232 587/6GA PC$5.25/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. FMC CORPORATION, AMERICAN VISCOSE DIVISION, NITRO, WEST VIRGINIA.
Final rept. May-Dec 72,
Robert E. Rosensteel, Steven K. Shama, and Jerome P. Flesch. Nov 73, 45p NIOSH-TR-091-74, HHE-72-21-91

Descriptors: *Hazardous materials, *Industrial medicine, *Carbon disulfide, *Hydrogen sulfide, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Rayon, Inorganic sulfides, Vapors.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

The National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees conducted a health hazard survey to determine exposure to carbon disulfide and hydrogen sulfide vapors in the spinning and cutting areas of viscose rayon manufacturing plant of FMC Corporation at Nitro, West Virginia. It was determined that exposure to carbon disulfide vapors at the concentrations found is toxic to workers in the cutting area, and that workers in the spinning area may occasionally be exposed to toxic carbon disulfide concentrations. These findings are based upon acute exposure and shift time-weighted average exposure concentration measurements, medical interviews, and iodine azide test results. It was also determined that a potentially toxic condition to workers does not exist from exposure to hydrogen sulfide vapors.

PB-232 663/5GA MF$1.45
National Research Council, Washington, D.C. Committee on Biologic Effects of Atmospheric Pollutants.
MANGANESE.
Jan 74, 199p* ISBN-0-309-02143X
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418 $6.25.

Descriptors: *Manganese, *Industrial medicine, Air pollution, Biochemistry, Plants(Botany), Epidemiology, Standards, Toxicity, Metabolism, Ecology, Concentration(Chemistry), Public health, Pathology, Occupational diseases, Bibliographies, Recommendations.
Identifiers: Ecosystems, *Air pollution effects(Humans).

The reports presents an evaluative study of what is known about the effects of manganese and recommends further research to determine safe degrees of exposure and minimal requirements for manganese in the total environment. The study focuses on airborne manganese, but biologic intake from all other routes is also considered. The volume provides more than 500 references to additional sources of information on manganese.

PB-232 721/1GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. WHIRLPOOL CORPORATION, FORT SMITH, ARKANSAS.
Final rept. Jan-Aug 73,
Harry L. Markel, Jr., and Steven K. Shama. Mar 74, 19p NIOSH-TR-121-74, HHE-72-100-121

Descriptors: *Hazardous materials, *Industrial medicine, *Chloromethanes, *Napthas, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Concentration(Composition), Solvents, Lung, Respiration, Exposure, Monitors.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Isocyanic acid/(methylphenylene-ester), Air quality.

In response to a request received from a representative of employees, the National Institute for Occupational Safety and Health (NIOSH), conducted a health hazard survey to evaluate exposure to toluene diisocyanate, methylene chloride and petroleum naphtha at the Whirlpool Corporation, Fort Smith, Arkansas. Based on medical/environmental evaluations, it was determined that toluene diisocyanate, methylene chloride and petroleum naphtha were not toxic in the concentrations found at the time of the survey. This determination was based on interviews with employees, workroom air concentrations, and pulmonary function tests.

PB-232 722/9GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. WHEELING-PITTSBURGH STEEL CORPORATION, MINGO, OHIO.
Final rept. Sep 73,
Bobby J. Gunter. Mar 74, 6p NIOSH-TR-120-74, HHE-73-44-120

Descriptors: *Hazardous materials, *Industrial medicine, *Dust, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Exposure, Steel making, Iron, Magnesium, Calcium, Carbon, Concentration(Composition).
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

The National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees conducted a health hazard survey to evaluate exposure to airborne contaminants present in the basic oxygen furnace areas at Wheeling-Pittsburgh Steel Corporation, Mingo, Ohio. Based on results of an environmental evaluation, it has been determined that nuisance dust in the breathing zone of workers in the basic oxygen furnace stock house and the basic oxygen lime station were at concentrations that could be hazardous.

PB-232 723/7GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. HEAD SKI COMPANY, BOULDER, COLORADO.
Final rept. Jun-Aug 73,
Bobby J. Gunter, and James B. Lucas. Mar 74, 20p NIOSH-TR-119-74, HHE-73-84-119

Descriptors: *Hazardous materials, *Industrial medicine, *Expoxy resins, *Solvents, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Skin(Anatomy), Exposure, Ethyl acetate, Methyl ethyl ketone, Chloromethanes, Asphalts, Styrene, Dermatitis.

Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH), in response to a request received from an employer to evaluate exposure to chemicals at the Head Ski Company, Boulder, Colorado. Based on medical evaluation it was determined that a definite cutaneous hazard due to allergic sensitization from epoxy resins, Dow 330 and Epon 815, existed in the ski mold area. Based on environmental sample analyses, it was determined that a hazardous condition from airborne contaminants did not exist.

PB-232 724/5GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. WHEELING-PITTSBURGH STEEL CORP., STEUBENVILLE, OHIO.
Final rept Jan 74,
Bobby J. Gunter, and Jerome P. Flesch. Mar 74, 5p NIOSH-TR-118-74, HHE-73-175-118

Descriptors: *Hazardous materials, *Industrial medicine, *Fumes, *Smoke, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Concentration(Composition), Steel making, Scarfing, Carbon monoxide, Iron oxides, Ozone, Dust.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

In response to a request received from a representative of employees, the National Institute for Occupational Safety and Health (NIOSH), conducted a health hazard survey to evaluate exposures to fumes and smoke in the hand scarfing area of Wheeling-Pittsburgh Steel Corp., Steubenville, Ohio. It was determined that total dust, iron oxide, carbon monoxide, and ozone were not toxic at the concentrations found at the time of the evaluation.

PB-232 725/2GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. ASHLAND OIL INCORPORATED, CATLETTSBURG, KENTUCKY.
Final rept. Oct 72-Aug 73,
Robert Vandervort, and James B. Lucas. Feb 74, 18p NIOSH-TR-109-74, HHE-72-77-109

Descriptors: *Hazardous materials, *Industrial medicine, *Pitch(Materials), Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Exposure, Asphalts, Petroleum products, Photosensitivity, Dermatitis, Dust, Concentration(Composition).
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

The National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees conducted a health hazard survey to evaluate employee exposure to flaked and molten petroleum pitch at the Asphalt Department of Ashland Oil, Inc., Catlettsburg, Kentucky. It was determined that petroleum pitch produces seasonal phototoxic reactions in employees at the concentrations normally used and found in the Asphalt Department. This determination is based on analysis of the pitch product in use, environmental air sampling, and medical interviews and cutaneous examinations of exposed employees.

PB-232 726/0GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. AEROJET GENERAL, INC., SACRAMENTO, CALIFORNIA.
Final rept. May-Aug 73,
Melvin T. Okawa, and Arnold Bodner. Jan 74, 8p NIOSH-TR-106A-74, HHE-73-81-106

Descriptors: *Hazardous materials, *Industrial medicine, *Solvents, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Exposure, Methyl ethyl ketone, Solid propellant rocket engines, Dermatitis, Concentration(Composition).
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Phenoxarsin/oxy-di, Ethylene/trichlora, Air quality.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees to evaluate exposure to toxic chemical at the Aerojet General Corporation in Sacramento, California. It was determined that the dust from 10,10'-Oxybisphenoxarsine was toxic in the concentrations experienced by employees when the compound was in production. This determination was based upon employee interviews and a review of medical records provided by the employer. It was also determined that trichloroethylene and methyl ethyl ketone were not toxic at the concentrations being used. The determination was based upon the judgement of the investigator after observing the amount of solvents being used and their conditions of use.

PB-232 729/4GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. ARCO POLYMER INCORPORATED, MONACA, PENNSYLVANIA.
Final rept. May-Aug 73,
Albert Maier, Raymond Ruhe, Robert Rosensteel, and James B. Lucas. Feb 74, 28p NIOSH-TR-107A-74, HHE-72-90-107

Descriptors: *Hazardous materials, *Industrial medicine, *Chemical industry, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Benzene, Fly ash, Styrene, Toluene, Ammonia, Mercury, Coal dust, Noise(Sound).
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

In response to a request received from a representative of employees, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to twenty three substances used or found at Arco Polymer Inc., Monaca, Pennsylvania. Hazardous exposures to toxic substances were determined to exist in the following areas: tricalcium phosphate dust in the Dylite-Dylene reactor and screening areas; coal dust in the power house; fly ash in the fly ash silo; and benzene in the styrene laboratory. Potentially toxic exposures were found with respect to toluene and benzene in the benzene building and the styrene cracking building; toluene, benzene, and ammonia in the semi-commercial area; and to mercury in the instrument repair shop. These determinations were based on environmental sampling. The medical evaluation concluded that no serious health or life threatening hazard could be identified as existing at the time of the study.

PB-232 730/2GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. YARDNEY ELECTRIC CO., PAWCATUCK, CONNECTICUT.
Final rept. Sep 73,
Henry Ramos, and James B. Lucas. Dec 73, 6p NIOSH-TR-101-74, HHE-73-69-101

Descriptors: *Hazardous materials, *Industrial medicine, *Nylon fibers, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Storage batteries, Fumes, Methylamine, Carbon monoxide, Gases.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

The National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees, conducted a health hazard survey to evaluate exposure to fumes generated from heating nylon screen frames at Yardney Electric Company, Pawcatuck, Connecticut. It has been determined that ammonia, carbon monoxide and methylamine gases potentially emitted from heated nylon are not toxic at concentrations measured during this evaluation. This determination was based on environmental levels of substances evaluated and medical histories.

PB-232 731/0GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. HARRIS STRUCTURAL STEEL CO., PISCATAWAY, NEW JERSEY.
Final rept. Sep 73,
Robert E. Rosensteel. Feb 74, 10p NIOSH-TR-108-74, HHE-73-99-108

Descriptors: *Hazardous materials, *Industrial medicine, *Spray painting, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Lead, Chromium, Iron oxide, Dermatitis, Vapors.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees to evaluate exposure to paint and paint vapors at Harris Structural Steel Company, Piscataway, New Jersey. It was determined that the exposure of spray painters to lead during spray painting is potentially toxic at the concentrations measured during this evaluation. It was further determined that the exposure of spray painters to chromium and iron oxide and the exposure of other workers to lead, chromium, and iron oxide at concentrations found during the evaluation are not expected to result in toxic effects to the exposed workers. The determination was based upon environmental measurements in the workplace, employee interviews, and toxicity literature.

PB-232 732/8GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. MERCIL PLATING COMPANY, CHICAGO, ILLINOIS.
Final rept. Sep 73,
Richard S. Kramkowski. Dec 73, 5p NIOSH-TR-100-74, HHE-73-105-100

Descriptors: *Hazardous materials, *Industrial medicine, *Electroplating, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Skin(Anatomy), Exposure, Acidity, Alkalinity.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards.

In response to a request received from a representative of employees, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to acids used in the electroplating processes at Mercil Plating Company, Chicago, Illinois. It has been determined that acids in the electroplating processes are not toxic as used or found. This determination is based on employee interviews, and observation of the work areas and of work practices.

PB-232 733/6GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. WHEELING-PITTSBURGH STEEL CORP., STEUBENVILLE, OHIO.
Final rept. Sep 73,

Bobby J. Gunter. Dec 73, 5p NIOSH-TR-102-74, HHE-73-45-102

Descriptors: *Hazardous materials, *Industrial medicine, *Carbon monoxide, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Iron and steel industry, Gases, Exposure.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

The National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees, conducted a health hazard survey to evaluate exposure to carbon monoxide at Wheeling-Pittsburgh Steel Corporation, Steubenville, Ohio. Based on results of an environmental evaluation, it has been determined that carbon monoxide exposures were not hazardous to employees when administrative controls (a work-rest schedule) were used.

PB-232 734/4GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. WHEELING-PITTSBURGH STEEL CORP., FOLLENSBEE, WEST VIRGINIA.
Final rept. Sep 73,
Bobby J. Gunter. Dec 73, 7p NIOSH-TR-103-74, HHE-73-43-103

Descriptors: *Hazardous materials, *Industrial medicine, *Coal tar, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Exposure, Vapors, Iron and steel industry, Benzene, Pitch(Material).
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH) in response to a request received from a representative of employees to evaluate exposure to coal tar pitch volatiles (benzene soluble fraction) at the Coke Plant East Works of Wheeling-Pittsburgh Steel Corp., Follensbee, West Virginia. Based on the results of an environmental evaluation, it has been determined that employee exposure to the concentrations of coal tar pitch volatiles found are potentially toxic.

PB-232 735/1GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. CUMMINS NORTHEASTERN INC., DEDHAM, MASSACHUSETTS.
Final rept. Aug 73,
Henry Ramos. Mar 74, 7p NIOSH-TR-110-74, HHE-73-5-110

Descriptors: *Hazardous materials, *Industrial medicine, *Solvents, *Cleaners, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Vapors, Degreasing, Cleaning, Phenol, Creosols, Sodium hydroxide, Diesel engines, Chloromethanes.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality.

In response to a request received from an employer, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposures to alkaline cleaner and cold solvent degreaser used in three areas at Cummins Northeastern Inc., Dedham, Massachusetts. It was determined that phenol/cresol, sodium hydroxide and methylene chloride were not toxic at the concentrations found in the work environment at the time of the evaluation. This determination was based on environmental measurements and employee interviews.

PB-232 736/9GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. AMERICAN STANDARD FIBERGLASS, INC., STOCKTON, CALIFORNIA.
Final rept. Aug-Dec 73,
Arnold H. Bodner, George J. Butler, and Melvin T. Okawa. Mar 74, 10p NIOSH-TR-128-74, HHE-73-103-128

Descriptors: *Hazardous materials, *Industrial medicine, *Styrene, *Isocyanates, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Exposure, Vapors, Noise(Sound), Dust, Dermatitis, Respiratory infections.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Air quality, Isocyanic acid/(methylene-diphenylene-ester).

The National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees, conducted a health hazard survey to evaluate exposure to toxic chemicals at American Standard Fiberglass, Inc., Stockton, California. It was determined that styrene and methylene bisphenyl isocyanate were toxic in the concentrations found at the time of this evaluation. This determination was based on environmental levels of styrene and methylene bisphenyl isocyanate, employee interviews, and current literature on styrene and methylene bisphenyl isocyanate toxicity.

PB-232 737/7GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. SCHNADIG CORPORATION, CORNELIA, GEORGIA.
Final rept. Nov 73,
William L. Wagner. Mar 74, 7p NIOSH-TR-127-74, HHE-73-124-127

Descriptors: *Hazardous materials, *Industrial medicine, *Hydrocarbons, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Napthas, Styrene, Chloromethanes, Furniture, Hydroperoxides, Vapors, Exposure.
Identifiers: *Occupational Safety and Health Act of 1970, *Toxic hazards, Butyl hydroperoxides, Air quality.

A health hazard survey was conducted by the National Institute for Occupational Safety and Health (NIOSH), in response to a request received from an employer to evaluate exposure to solvent vapors in the Plastic Department of the furniture mill, Schnadig Corporation, Cornelia, Georgia. It was determined that no health hazard existed from exposure to styrene or methylene chloride. A very minimal but potential hazard was considered to exist from exposure to petroleum distillate (naphtha) vapors. Methyl ethyl ketone peroxide concentrations were not evaluated. These determinations were based on environmental measurements, conditions of use, employee interviews, and available toxicity literature.

PB-232 738/5GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. SOUTHERN STEEL AND WIRE COMPANY, FORT SMITH, ARKANSAS.
Final rept. Aug 73,
Harry L. Markel, Jr. Mar 74, 5p NIOSH-TR-125-74, HHE-73-111-125

Descriptors: *Hazardous materials, *Industrial medicine, *Plating, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Fumes, Welding, Inorganic acids, Hydrochloric acid, Chromates, Cyanides.
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

In response to a request received from a representative of employees per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to emissions from acid tanks and welding operations in the plating department of Southern Steel and Wire Company, Fort Smith, Arkansas. It was determined that fumes from the acid tanks and welding operations were not toxic at the concentrations found during the evaluation. This determination was based on employee interviews and results of environmental sampling.

PB-232 739/3GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. TRANTEX CORPORATION, SPRINGFIELD, MASSACHUSETTS.
Final rept. Dec 73,
Lee B. Larsen. Mar 74, 8p NIOSH-TR-124-74, HHE-73-165-124

Descriptors: *Hazardous materials, *Industrial medicine, *Solvents, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Vapors, Ethyl acetate, Methyl ethyl ketone, Ethyl alcohol, Propanols.
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

The National Institute for Occupational Safety and Health (NIOSH), conducted a health hazard survey to evaluate exposure to solvent vapors at Trantex Corporation, Springfield, Massachusetts. It was determined that ethyl acetate, n-propyl alcohol, ethyl alcohol, and methyl ethyl ketone were not toxic at the concentrations found at the time of the evaluation. This determination was based on employee interviews, and results of environmental sampling.

PB-232 740/1GA PC$4.25/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. MARSH PLATING CORPORATION, YPSILANTI, MICHIGAN.
Final rept. Jan-Oct 73,
Steven R. Cohen, and Richard S. Kramskowski. Dec 73, 24p NIOSH-TR-104-74, HHE-72-118-104

Descriptors: *Hazardous materials, *Industrial medicine, *Electroplating, *Chromic acid, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Exposure, Skin(Anatomy), Respiratory system, Vapors.
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

In response to a request received from a representative of employees per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH), conducted a health hazard survey to determine exposure to chromic acid used in electroplating processes of the Marsh Plating Corporation, Ypsilanti, Michigan. It has been determined that exposure to chromic acid as found within the nickel-chrome plating department of this facility is toxic. This study showed a very high incidence of nasal pathology which developed over a protracted period of time at extremely low environmental levels of exposure to chromic acid. Recommendations have been offered to the plant management regrading both the environmental and medical aspects of safe usage for chromic acid.

PB-232 741/9GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. BANNER IRON WORKS, ST. LOUIS, MISSOURI.
Final rept.,

George J. Butler, and John Cromer. Mar 74, 14p NIOSH-TR113-74, HHE-73-95-113

Descriptors: *Hazardous materials, *Industrial medicine, *Silicon dioxide, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Dust, Iron and steel industry, Casting, Exposure.
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

The National Institute for Occupational Safety and Health (NIOSH), in response to a request from a representative of employees per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970 conducted a health hazard survey to evaluate exposure to dust which is produced from the cleaning of castings at the Banner Iron Works, St. Louis, Missouri. It has been determined on the basis of professional judgement and environmental evaluation that a potential health hazard exists from exposure to free silica containing dust during this process.

PB-232 742/7GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. SWISS CLEANSING COMPANY, PROVIDENCE, RHODE ISLAND.
Final rept. Sep-Nov 73,
Melvin T. Eddleston, and Phillip Lee Polakoff. Mar 74, 12p NIOSH-TR-114-74, HHE-73-86-114

Descriptors: *Hazardous materials, *Industrial medicine, *Dry cleaning, *Tetrachloroethylene, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Vapors, Exposure.
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

In response to a request received from an employer per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH), conducted a health hazard survey to evaluate exposure to tetrachloroethylene vapors from dry cleaning machines at the Swiss Cleansing Company, Providence, Rhode Island. Based on environmental and medical evaluations, it has been determined that the dry cleaner and possible marker employees are exposed to potentially toxic levels of tetrachloroethylene.

PB-232 743/5GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. SOUTHWESTERN OHIO STEEL INC., HAMILTON, OHIO.
Final rept. Nov 73,
Henry Ramos. Mar 74, 7p NIOSH-TR-112-74, HHE-73-155-112

Descriptors: *Hazardous materials, *Industrial medicine, *Carbon dioxide, *Nitrogen dioxide, *Steel plants, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Gases, Exposure, Concentration(Composition).
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

Per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH), conducted a health hazard survey to evaluate carbon monoxide and nitrogen dioxide exposures in the coil department of the Southwestern Ohio Steel Company plant in Hamilton, Ohio. It was determined that carbon monoxide and nitrogen dioxide at the concentrations found in the work environment at the time of the evaluation were not toxic. This determination was based on environmental levels of carbon monoxide and nitrogen dioxide, employee interviews, and literature on toxicity of gases evaluated.

PB-232 744/3GA PC$4.00/MF$1.45
National Inst. of Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. CHEVROLET TRUCK ASSEMBLY PLANT, FLINT, MICHIGAN.
Final rept. Dec 73,
Raymond O. Rivera. Mar 74, 7p NIOSH-TR-115-74, HHE-73-63-115

Descriptors: *Hazardous materials, *Industrial medicine, *Carbon monoxide, *Automotive industry, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Exhaust gases, Exposure, Concentration(Composition).
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

The National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970 conducted a health hazard survey to evaluate exposure to carbon monoxide in the New Car Shipping Building of General Motors Chevrolet Truck Assembly Plant, Flint, Michigan. Based on two-hour exposures and the absence of reported symptomatology, it is judged that carbon monoxide is not toxic in the concentration found under normal conditions in the New Car Shipping Building.

PB-232 745/0GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. PACIFIC MOULDED PRODUCTS COMPANY, LOS ANGELES, CALIFORNIA.
Final rept. Dec 73,
Melvin T. Okawa. Mar 74, 6p NIOSH-TR-122-74, HHE-73-169-122

Descriptors: *Hazardous materials, *Industrial medicine, *Solvents, *Painting, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Spray painting, Vapors, Methyl ethyl ketone, Xylenes, Toluene, Naphthas, Silicones.
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

In response to a request received from a representative of employees per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to silicone vulcanizer paint spray at the Pacific Moulded Products Company, Los Angeles, California. It was determined that the vapors of methyl ethyl ketone, xylene, toluene, and petroleum naphtha were not toxic at the concentrations measured during this evaluation. The determination was based on environmental levels of these solvents, analyses of work practices, employee interviews, and available literature on the toxicities of these compounds.

PB-232 748/4GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. EASTEX PACKAGING, INC., MEMPHIS, TENNESSEE.
Final rept. Oct 73,
Harry L. Markel, Jr. Mar 74, 5p NIOSH-TR-126-74, HHE-73-56-126

Descriptors: *Hazardous materials, *Industrial medicine, *Printing inks, *Adhesives, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Vapors, Exposure, Skin(Anatomy), Concentration(Composition).
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

In response to a request received from a representative of employees per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to printing ink and/or adhesives in the finishing department of Eastex Packaging, Inc., Memphis, Tennessee. It was determined that printing ink and/or adhesives are not toxic to employees as normally encountered in finishing department operations. This determination was based upon employee interviews, and observations of process operations and work practices.

PB-232 749/2GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. DELCO MORAINE DIVISION, GMC CORP., DAYTON, OHIO.
Final rept. Sep-Oct 73,
Robert E. Rosensteel, and James B. Lucas. Mar 74, 17p NIOSH-TR-116-74, HHE-73-40-116

Descriptors: *Hazardous materials, *Industrial medicine, *Automotive industry, *Metals, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Exposure, Concentration(Composition), Dust, Exposure, Cutting fluids, Skin(Anatomy).
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

The National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to toxic substances at the Delco Moraine Division of General Motors Corporation, Dayton, Ohio. It has been determined that antimony, asbestos, chromic acid, copper, cyanide, iron, lead, nickel, cutting oils, sodium, tin, and zinc stearate would not be expected to cause effects to exposed workers at the concentrations measured during the evaluation. This determination was based upon air measurements, review of medical records, medical interviews, and available literature regarding toxicity of the substances of the evaluation.

PB-232 750/8GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. EMPIRE-DETROIT STEEL DIVISION, NEW BOSTON, OHIO.
Final rept. Jan 74,
Bobby J. Gunter. Mar 74, 4p NIOSH-TR-123-74, HHE-73-179-123

Descriptors: *Hazardous materials, *Industrial medicine, *Carbon monoxide, *Steel plants, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Gases, Exposure, Concentration(Composition), Blast furnaces.
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

In response to a request received from a representative of employees per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to carbon monoxide at Empire-Detroit Steel Division, New Boston, Ohio. At the time of this evaluation, it was determined that the concentration of carbon monoxide was not toxic in the blast furnace area. This determination was based on results of environmental sampling, observation of the work area, and employee interviews.

PB-232 751/8GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. RCA GRIMES LAND WAREHOUSE, BLOOMINGTON, INDIANA.
Final rept. Sep-Oct 73,

Melvin T. Eddleston, and John W. Cromer, Jr. Jan 74, 13p NIOSH-TR-105A-74, HHE-73-98-105

Descriptors: *Hazardous materials, *Industrial medicine, *Carbon monoxide, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Exhaust gases, Exposure, Concentration(Composition), Cargo transportation.
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

In response to a request received from a representative of employees per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposure to carbon monoxide from liquified propane powered industrial trucks in use at the RCA Grimes Lane Warehouse, Bloomington, Indiana. It has been determined that employees working at the north loading dock are exposed to potentially toxic concentrations of carbon monoxide. This determination is based upon worker exposure to 8-hour time-weighted-average concentrations of carbon monoxide which exceeded 35 parts per million, and the significant rise and high level of carboyxhemoglobin found in the blood of non-smoking industrial truck workers.

PB-232 752/6GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. BARKER GREETING CARD COMPANY, CINCINNATI, OHIO.
Final rept. Jun 72-May 73,
Harry L. Markel, Jr., and EdwardShumnes. Mar 74, 17p NIOSH-TR-129-74, HHE-72-33-129

Descriptors: *Hazardous materials, *Industrial medicine, *Dust, *Flocked fabrics, Toxicity, Criteria, Inspection, Recommendations, Industrial hygiene, Solvents, Exposure, Concentration(Composition), Skin(Anatomy).
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

Per the authority of Section 20(a)(6) of the Occupational Safety and Health Act of 1970, the National Institute for Occupational Safety and Health (NIOSH) conducted a health hazard survey to evaluate exposures to airborne dust at Barker Greeting Card Company, Cincinnati, Ohio. Based upon the results of the environmental/medical study, it was determined that, under conditions found at the time of the survey, concentrations of airborne dust and a type of Stoddard solvent were not toxic and did not constitute a hazard to the health of workers in the flocking department. Additionally, it was concluded that airborne flock did result in mechanical irritation from deposition of fibers in skin creases, and that individuals' with pre-existing throat and sinus conditions were made worse by constant deposition of flock in oral and nasal passages.

PB-232 753/4GA PC$4.00/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
HEALTH HAZARD EVALUATION/TOXICITY DETERMINATION. RICE GROWERS ASSOCIATION, WEST SACRAMENTO, CALIFORNIA.
Final rept. Oct 73,
Melvin T. Okawa. Mar 74, 5p NIOSH-TR-111-74, HHE-73-152-111

Descriptors: *Hazardous materials, *Industrial medicine, *Dust, Toxicity, Criteria, Inspection, Standards, Recommendations, Industrial hygiene, Rice, Mills, Exposure, Concentration(Composition).
Identifiers: Occupational Safety and Health Act of 1970, Air quality.

The National Institute for Occupational Safety and Health (NIOSH), in response to a request received from a representative of employees per the authority of Section 20 (a)(6) of the Occupational Safety and Health Act of 1970, conducted a health hazard survey to evaluate exposure of railroad workers to rice hull dust at the Rice Growers Association facilities in West Sacramento, California. It was determined that rice hull dust was not toxic in the concentrations experienced by train crew workers in the work environment at the time of the environmental evaluation. This determination was based on the investigator's judgment of the work situation and employee interviews.

PB-232 776/5GA PC$3.75/MF$1.45
National Inst. for Occupational Safety and Health, Rockville, Md.
ENVIRONMENTAL SURVEYS OF ALUMINUM REDUCTION PLANTS.
Final rept.,
Patrick J. Shuler, and Philip J. Bierbaum. Apr 74, 56p* NIOSH-TR-205-74, NIOSH-TR-74-101

Descriptors: *Aluminum industry, *Industrial atmospheres, *Air pollution, *Carcinogens, Ammonia, Sulfur dioxide, Coal tar, Dust, Florida, Carbon monoxide, Cryolite, Reduction, Pitch(Material), Industrial plants, Processing, Materials recovery, Gas sampling, Filtration, Aromatic polycyclic hydrocarbons, Industrial medicine, Personnel.
Identifiers: Noise(Sound), Air pollution detection, *Indoor air pollution.

The purpose of this report is to summarize the environmental surveys of four aluminum reduction plants in the Eastern United States, including prebaked, horizontal pin Soderberg and vertical pin Soderberg operations. The major emphasis of the environmental studies was to determine the extent of worker exposures to potential carcinogenic compounds found in coal tar and petroleum pitch volatiles; however, exposures to total airborne dust, airborne fluorides, carbon monoxide, sulfur dioxide, ammonia and noise also were documented. The report presents a description of aluminum reduction processing and associated worker activities for the three production types that were surveyed, the environmental sampling procedures utilized, a summary of sampling results and conclusions that can be drawn from the surveys.

6K. Life Support

AD-779 857/2GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
QUICK RELEASE COUPLING FOR SPIT-COCK VALVE ON STANDARD DEEP SEA DIVERS AIR HELMET.
W. F. Searle, Jr., and C. M. Prickett. 14 Apr 59, 19p Rept no. NEDU-Evaluation-18-59

Descriptors: *Breathing apparatus, *Helmets, *Diver equipment, Performance(Engineering), Oceans, Naval research, Deep water, Respiration, Air flow, Valves, Couplings, Disconnect fittings.
Identifiers: Underwater breathing equipment, Evaluation, Recommendations.

The report discusses a simple, easily manipulated system for supplying the deep sea diver with an emergency, alternate air supply. The use of the commercial quick connect coupling fitted at the end of a standard lightweight oxygen/air hose and mating onto a modified spit-cock on the helmet provides an easy, safe method of furnishing an alternate air supply to a distressed deep sea diver. The modification proposed is within the capacity of forces afloat to accomplish, subject to the provision of a parts kit. It is recommended that the spit cock emergency supply system be made standard on all U.S.N. deep sea helmets. It is recommended that a conversion kit be furnished all diving activities to modify all existing helmets.

AD-780 161/6GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
LINDE MIXED-GAS CONSTANT MASS FLOW REGULATOR: PRELIMINARY EVALUATION OF THE FLOW CHARACTERISTICS OF THE PROTOTYPE REGULATOR.
Final rept.,
C. J. Leyden, and W. F. Searle, Jr. 25 Aug 58, 22p Rept no. NEDU-Evaluation-3-59

Descriptors: *Diver equipment, *Regulators, *Breathing apparatus, Flow rate, Hyperbaric conditions, Reliability, Test methods, Scuba diving.
Identifiers: *Mixed gas scuba regulators.

A mixed-gas scuba regulator for use as a component part of a standard mixed-gas scuba is evaluated. The unit's flow characteristics (constant-mass-flow with increasing depth), when used in conjunction with changeable orifice plates, were found to be satisfactory in all respects. The practicability of using a single orifice plate and varying regulator pressure to obtain desired flows is demonstrated but the selection of a single, optimum orifice plate is left for further test and development. The regulator's weight and bulk are alightly larger than desired and it is recommended that efforts be made to reduce them. (Author)

AD-780 162/4GA PC$3.25/MF$1.45
Navy Experimental Diving Unit Washington D C
EVALUATION OF SECOND PREPRODUCTION SAMPLE OF U. S. DIVERS CO. TWO STAGE OPEN CIRCUIT 'AQUA-MASTER' SCUBA REGULATOR.
Final rept.,
C. W. Hanger, and W. F. Searle, Jr. 30 Mar 59, 28p Rept no. NEDU-Evaluation-16-59

Descriptors: *Diver equipment, *Regulators, *Breathing apparatus, Valves, Pressure breathing, Resistance, Reliability, Scuba diving, Test methods.
Identifiers: *Open circuit scuba regulators.

A second preproduction sample (NObs 74166) of an open circuit Scuba demand regulator is given a complete evaluation in accordance with applicable military and purchase specifications and the standard Experimental Diving Unit (EDU) evaluation procedure. The equipment evaluated consists of a two stage regulator, the D.A. Aqua-Master. This second preproduction sample is essentially the same as that in EDU Evaluation Report 8-59. In addition to substituting the old style upper cover and exhaust flapper valves, the manufacturer provided a new style molded rubber exhaust flapper. (Modified author abstract)

AD-780 164/0GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
EVALUATION OF CIRCLE CLAMP CORP. DEEP SEA DIVERS HOSE CLAMPS.
C. J. Leyden, and W. F. Searle, Jr. 2 Sep 58, 14p Rept no. NEDU-Evaluation-5-59

Descriptors: *Diver equipment, *Clamps, *Breathing apparatus, Hoses, Reliability, Test methods, Safety.

A simple hose clamp is evaluated as a possible substitute for the bronze, screw-type clamp on the standard diver's air hose coupling. The clamp is found to have adequate holding power but has several minor disadvantages and no real advantages over the standard clamp and, as such, is not recommended for adaptation as standard though its use as a war time substitute item is considered warranted. (Author)

AD-780 166/5GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
OXYGEN CELL WARNING DEVICE.
Interim evaluation rept.,
R. T. Van Orden, and T. W. James. 8 Sep 59, 22p Rept no. NEDU-Evaluation-4-60

Descriptors: *Breathing apparatus, *Diver equipment, *Warning systems, Test methods, Specifi-

cations, Military requirements, Scuba divers, Oxygen, Carbon dioxide, Respiration, Electrolytic cells.
Identifiers: *Underwater breathing equipment, Recommendations.

An oxygen warning device consisting basically of an oxygen galvanic cell was given practical tests to simulate its application in scuba mixed gas equipment as an indicator of low oxygen percentage. Two improved cell types were also tested. While the hardware of the original device was not considered practical for direct application in the scuba equipment, the cells were found to perform satisfactorily in terms of following the predicted output curve under most simulated conditions. Minor inadequacies which hold promise of correction were found in the cells including zero stability, time of reaction, response to gross wetting, and erratic behavior in presence of carbon dioxide. (Modified author abstract)

AD-780 168/1GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
A COMPARATIVE EVALUATION OF THE STANDARD U. S. NAVY SHALLOW WATER DIVERS MASK, AND THE SCOTT AVIATION CORP. 'CONSTANT FLOW SHALLOW WATER DIVING MASK'.
Final rept.,
C. M. Prickett, and W. F. Searle, Jr. 24 Mar 59, 17p Rept no. NEDU-Evaluation-14-59

Descriptors: *Diver equipment, *Breathing masks, Test methods.

A new commercial shallow water divers mask is evaluated in comparison with the older standard shallow water divers mask. The new mask is considered an acceptable shallow water mask. (Author)

AD-780 212/7GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
DETROIT CONTROLS DIVISION CONSTANT MASS FLOW REGULATOR: PRELIMINARY EVALUATION OF THE FLOW CHARACTERISTICS OF THE PROTOTYPE REGULATOR,
W. L. Marshall, G. M. Janney, and G. W. Hanger. 26 Aug 59, 21p Rept no. NEDU-Evaluation-2-60

Descriptors: *Scuba divers, *Breathing apparatus, *Regulators, Gas flow, Control systems, Flow rate, Acceptability, Underwater equipment.

The study was undertaken to evaluate the prototype model of a mixed-gas scuba regulator developed by the Detroit Controls Division of the American Radiator and Standard Sanitary Co. for use as a component part of a standard USN mixed-gas scuba. The units stability over long time flow appeared acceptable, but its reproducibility was not. Its flow characteristics as a function of supply pressure was not satisfactory. The constant-mass-flow characteristics with increasing depth at a given supply pressure appear to be acceptable, but when the supply pressure is reduced the flow falls off unacceptably. Continued development of this regulator, while feasible, appears to be rather impractical in view of some of the other developments in this area. (Author)

AD-780 318/2GA PC$3.25/MF$1.45
Navy Experimental Diving Unit Washington D C
EVALUATION OF SCOTT AVIATION CORPORATION DEMAND TYPE CLOSED-CIRCUIT OXYGEN SCUBA.
Final rept.,
J. V. Harter, and J. E. Mullen. 21 Sep 65, 38p Rept no. NEDU-Evaulation-5-65

Descriptors: *Diver equipment, *Breathing masks, *Scuba diving, Reliability, Oxygen, Carbon dioxide, Specifications, Valves.
Identifiers: *Closed circuit oxygen scuba.

The Scott Aviation corp. double-Demand Oxygen SCUBA developed under specification requirements of BUSHIPS Contract NObs 88356 was evaluated through a series of laboratory tests of individual components and subjective tests of the complete assembly. The contract called for inclusion of mechanical features not previously included in the U.S. Navy equipment. These features were (1) a hydrostatically balanced demand system, (2) 3000 psi oxygen cylinder with a half bottle pressure reserve, (3) breathing bags of dipped neoprene latex construction, (4) gas control to consist of demand valve, needle control set for 0.9 of a liter and a bypass, (5) the swimmer should be able to cut the demand system out of the circuit when necessary. (Modified author abstract)

AD-780 319/0GA PC$3.25/MF$1.45
Navy Experimental Diving Unit Washington D C
VISUAL FIELD PERIMETER AND DISTORTION IN DIVING MASKS.
Final rept.,
R. D. Workman, and C. M. Prickett. 1 Feb 57, 50p Rept no. NEDU-Evaluation-4-57

Descriptors: *Vision, *Breathing masks, *Diver equipment, Distortion, Measurement.
Identifiers: *Diving masks, *Visual field perimeter.

The evaluation was made to determine limitation of visual field perimeter and distortion within this perimeter for various diving masks. The report describes use of the perimeter detector and measurement of the visual field and distortion while wearing various diving masks. Restriction of the visual field by the diving masks evaluated was found to be from 40 to 50 degrees. Distortion was found only in the outer 2 degrees of the visual field. The results are discussed and recommendations are made for masks with the least restricted visual field. A standard masks with the least restricted visual field. A standard evaluation procedure is outlined for use in determining visual Field restriction and distortion in diving masks. (Author)

AD-780 320/8GA PC$4.00/MF$1.45
Navy Experimental Diving Unit Washington D C
AN EVALUATION OF THE RAND FLOW INDICATOR AS A WARNING DEVICE IN THE CONSTANT-MASS-FLOW SUPPLY CIRCUIT OF A SEMI-CLOSED CIRCUIT SCUBA.
Final rept.,
W. G. Fischer, C. J. Leyden, and W. F. Searle, Jr. 4 Feb 58, 82p Rept no. NEDU-Evaluation-4-58

Descriptors: *Diver equipment, *Flowmeters, *Breathing masks, *Gas flow, Flow rate, Calibration, Warning systems, Scuba diving, Reliability.

The evaluation considers the principle of operation and adequacy of an apparatus submitted as a warning device for insertion in a mixed-gas scuba gas supply circuit wherein the gas is supplied at constant-mass rate independent of depth of dive. The device was found to be satisfactory in principal but, in its prototype form, not adequate for use at flow rates and depths experienced in operational mixed-gas diving. Extensive calibration curves are presented as well as results of its operation when used in a constant-mass-flow circuits. (Modified author abstract)

AD-780 415/6GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
BENDIX-FRIEZ WRIST DEPTH GAUGE.
Final rept.,
C. J. Leyden. 8 Nov 56, 10p Rept no. NEDU-Evaluation-9-57

Descriptors: *Depth indicators, *Diver equipment, Visibility, Reliability, Accuracy, Specifications, Test methods.
Identifiers: *Wrist depth gauges.

The report covers the evaluation of the Bendix-Friez Wrist Depth Gauge to determine the ability of the gauge to meet the accuracy and visibility specifications as outlined by the Bureau of Ships to depths of 200 feet. The gauge was tested by chamber depth runs to 200 feet with instrumentation for recording true depth, and by the use of a subject in a completely darkened tank filled with 8 feet of water. (Modified author abstract)

AD-780 416/4GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
NORTHHILL AIR LUNG REGULATOR.
Final rept.,
C. J. Keyden. 9 Jan 57, 6p Rept no. NEDU-Evaluation-12-57

Descriptors: *Breathing apparatus, Regulators, Diving, Naval personnel.
Identifiers: *Scuba apparatus, Underwater breathing equipment.

The report covers the evaluation of the Northill Air Lung Regulator to determine the suitability and breathing characteristics of the apparatus for use in the Naval service when the air bottles are charged to 3000 psi. (Author)

AD-780 417/2GA PC$3.25/MF$1.45
Navy Experimental Diving Unit Washington D C
EVALUATION OF A PROPOSED UNDERWATER SWIMMER'S LIFE JACKET.
Final rept.,
H. L. Brooks, Jr., C. J. Leyden, C. M. Prickett, and W. F. Searle, Jr. 24 Oct 58, 31p Rept no. NEDU-Evaluation-7-59

Descriptors: *Life jackets, *Scuba diving, Buoyancy, Carbon dioxide, Control.

The requirements for a Scuba Life Preserver for use at depths to 100 ft. are studied along with the characteristics of the existing UDT Life Preserver and the Submarine Life Preserver. It is concluded that a Scuba Life Preserver having 15 pounds positive buoyancy at 100 ft. and 24 pounds buoyancy at the surface is feasible and specific recommendations are made for the construction of prototype units. (Author)

AD-780 418/0GA PC$3.25/MF$1.45
Navy Experimental Diving Unit Washington D C
SPECIAL TOOLS, TOOL KIT AND MAINTENANCE PROCEDURES FOR U.S. DIVERS CO. REGULATORS; MODEL DA AND MODEL AQUA MASTER.
Evaluation rept.,
B. L. Powell, and W. F. Searle. 1 May 59, 32p Rept no. NEDU-Evaluation-22-59

Descriptors: *Diver equipment, *Tool kits, Maintenance, Regulators, Repair.

A final version of a Special Tool Kit and procedures for the overhaul of the U.S. Divers Co. Model DA AQUA LUNG is evaluated and recommended for adoption. Details for the tools, roll-up canvas kit and tool box are included. The list is extended, by minor modification to be equally adaptable to the newer U.S. Divers Co. regulator, Model AQUA MASTER. Revised Corrective Maintenance procedures are included. (Author)

6L. Medical and Hospital Equipment

AD-780 437/9GA PC$5.50/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
USING INTERACTIVE GRAPHICS IN SIMULATING THE HOSPITAL EMERGENCY ROOM,
Richard W. Weissberg. May 74, 186p Rept no. MAC-TR-129
Contract N00014-70-A-0362-0006, ARPA Order-2095

Sponsored in part by National Science Foundation Grant NSF-GI-38004.

Descriptors: *Medical services, *Interactive graphics, Hospitals, Computerized simulation, Computer graphics, Simulation, Systems analysis, Computer programs, Theses.
Identifiers: Hospital administration, *Hospital emergency rooms, *Emergency medical care, MAC project, TIGERS computer program.

The hospital emergency room is a complex system having many interrelated factors contributing to its operation. A computer program has been designed which uses computer graphics and interaction with the user to create a flexible modeling environment for analysis of hospital emergency rooms. In projects involving analysis of public systems, it is especially important that close communication be maintained between the public administrator and the analyst. Tools of the type which concern the present research can make a significant contribution towards this end.

COM-74-11092/5GA PC$3.75/MF$1.45
National Bureau of Standards, Washington, D.C. Metallurgy Div.
SURVEY ON METALLIC IMPLANT MATERIALS.
Final rept. 1 Jul 72-30 Jun 73,
J. R. Parsons, and A. W. Ruff. Dec 73, 55p*
NBSIR-73-420

Descriptors: *Metals, Implantation, Mechanical properties, Toxicity, Tissues(Biology), Corrosion resistance, Stainless steels, Cobalt alloys, Titanium.
Identifiers: *Biomaterials, Tissue compatible materials.

The application of metallic materials as orthopedic implants in the human body is reviewed, concentrating on materials presently in clinical use and undergoing laboratory evaluation for possible future use. The criteria considered explicitly are tissue compatibility, mechanical properties, corrosion resistance, and toxicity. The three principal metallic implant materials, stainless steel, cobalt alloys, and titanium, are discussed in detail. Wherever possible, comparisons are made between the materials in terms of the intended application.

COM-74-50533/0GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
STANDARD REFERENCE MATERIALS: DESCRIPTION AND USE OF PRECISION THERMOMETERS FOR THE CLINICAL LABORATORY, SRM 933 AND SRM 934.
Final rept.,
B. W. Mangum, and J. A. Wise. May 74, 23p NBS-SP-260-48
Library of Congress Catalog Card no. 74-7455. See also rept. no. NBS-SP-260-47, COM-74-50176.
Paper copy available from GPO $0.60 as C13.10:260-48.

Descriptors: *Temperature measuring instruments, Medical laboratories, Chemical laboratories, Precision, Calibrating, Standards, Accuracy.
Identifiers: *Standard reference materials.

Because of the high sensitivity to temperature of many facets of the clinical laboratory, e.g. in enzyme reactions and in pH and blood gas analysis, there is a need for accurate temperature measurements and its control. In order to help satisfy these needs and to aid in getting a usable and accurate temperature scale into the clinical laboratory, the National Bureau of Standards has developed SRM 933 and SRM 934. These are precision thermometers, which are calibrated at 0C, 25C, 30C, and 37C and their description, their calibration, and the procedures for their proper usage are discussed.

PB-232 550/4GA PC$3.25/MF$1.45
Center for Blood Research, Boston, Mass.
NEW METHODS OF PLASMA FRACTIONATION.
Interim rept. 1 Jun 73-1 Apr 74,
Robert B. Pennell. 1 Apr 74, 49p NIH/NHLI-N01-HL-3-2968-1
Contract N01-HL-3-2968

Descriptors: *Blood plasma, Humans, Distillation, Ethanols, Proteins, Globulins, Gamma globulin, Automation.
Identifiers: Fractionation.

The objective of this contract is to prepare plasma fractions of known clinical value by means that will be more economical and more efficient than the procedures now universally used. The resulting plasma components will sufficiently resemble presently licensed plasma components as to make clinical acceptability and licensing readily feasible. The approach to this objective is to convert Cohn-cold-ethanol methods 6 and 9 for plasma fractionation from discontinuous batch operation to continuous automated operation. Cohn cold-ethanol methods 6 and 9 are the only methods presently permitted for preparation for clinical use of the major human plasma fractions.

PB-232 641/1GA PC$4.50/MF$1.45
Jet Propulsion Lab., Pasadena, Calif.
EFFECTS OF THE PHYSIOLOGICAL ENVIRONMENT ON THE LONG-TERM PHYSICAL PERFORMANCE OF POLYMERIC MATERIALS.
Annual rept., Oct 72-Nov 73,
J. Moacanin, R. F. Fedors, J. D. Ingham, and E. F. Cuddihy. 14 Mar 74, 105p JPL-1200-160

Descriptors: *Elastomers, *Mechanical organs, *Prosthetic devices, Mechanical properties, Medical equipment, Implantation, Stability, Durability, Tensile strength.
Identifiers: *Biomaterials, *Blood compatible materials.

Extensive studies were made on the time-dependent physical properties of segmented polyether-urethanes, a class of elastomers being evaluated for implantable devices. It was shown that uniaxial tensile properties can be factorized, as previously demonstrated for conventional vulcanizates. Hence, a basis for the assessment of long-term fatigue was established. Moreover, it was shown that sorbed water modifies properties markedly. The swelling behavior in water of both the urethane elastomer and of poly-HEMA grafted to the same elastomer was studied. Swelling of the poly-HEMA phase was nearly independent of crosslink density. A unique dip-molding process was developed for the fabrication of bladders from the urethane elastomer.

PB-232 664/3GA PC$3.25/MF$1.45
Missouri Univ., Medical Center, Columbia. Div. of Nephrology.
ADHERENCE OF BLOOD COMPONENTS TO ARTIFICIAL KIDNEY MEMBRANES. EFFECTS OF DIALYSANCE OF LOW AND MIDDLE MOLECULAR WEIGHT SOLUTES.
Annual rept. 1 Mar 73-28 Feb 74,
Karl D. Nolph, and John F. Maher. 15 Feb 74, 42p* AK-2-72-6602
Contract PHS-72-2202
See also PB-224 013.

Descriptors: *Artificial kidneys, *Blood, Mechanical organis, Dialyzers, Membranes, Performance evaluation, Surface properties, In vitro analysis.
Identifiers: *Hemodialysis.

Effects of the adherence of blood components to dialyzer membranes were assessed in coils and hollow fiber kidneys. Dialysances of multiple solutes were measured using an aqueous perfusate at 100 ml/min single pass before and after in vitro perfusion of artificial kidneys with whole blood. Similar studies were also performed before and after clinical dialyses with various coils and hollow fiber dialyzers. Extensive coating of membranes was present and studied morphologically in all dialyzers. Irreversible detrimental changes occurred in all HFK and reuse was not feasible. Coils could be reused up to six times as long as air rinsing of blood from the coils was not employed with no deterioration in dialysance values.

PB-232 783/1GA PC$8.25/MF$1.45
Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
AIR TREATMENT FOR ODOR CONTROL IN THE HOSPITAL.
Final rept. 1 Feb 68-30 Jun 71,
Thomas W. Kethley. Jan 74, 103p BHSR-74-34
Contract PHS-HS-00068

Descriptors: *Hospitals, *Odor control, *Operating rooms, Activated carbon treatment, Deodorizing, Filtration, Air pollution, Ventilation, Sulfur dioxide, Formaldehyde, Water vapor, Hydrocarbons, Recommendations, Air washers.
Identifiers: Indoor air pollution, Health services research and development.

The purpose of the project was to study odors in hospital operating rooms (O.Rs) and to determine what could be done to remove them. It was found that the makeup air required for odor control in the hospital O.R. is not much greater than two changes per hour equivalent of fresh air. It was also determined that water-soluble gases could be removed by water washers and that vaporous odorants from the air are best removed by carbon filters.

6M. Microbiology:

AD-780 045/1GA PC$3.00/MF$1.45
Army Medical Research Lab Fort Knox Ky
ISOLATION AND PURIFICATION OF HEPATITIS-ASSOCIATED ANTIGEN BY ELECTROCHROMATOGRAPHY.
Progress rept.,
Anthony J. Luzzio. 27 Mar 74, 18p* Rept no. USAMRL-1089

Descriptors: *Hepatitis, *Antigens, Purification, Isolation, Chromatography, Viruses, Proteins.
Identifiers: Australia antigen, *Electrochromatography.

The electrochromatograph is a unique glass device designed to function as: (1) a column chromatograph whereby mixed proteins can be separated by allowing them to filter through resins which act as molecular sieves, (2) an electrophoresis column whereby proteins will be separated according to their electrophysical properties, and (3) it can be operated so that both column chromatography and electrophoresis can function simultaneously (electrochromatography) in one operation. When operated as an electrochromatograph column, proteins of the same molecular size, but different electrophoretic mobilities, will be separated by electrophoresis; whereas, proteins of the same electrophoretic mobilities, but which vary in molecular size, will be separated by molecular sieving. If proteins vary only slightly in these physical properties, separation is greatly enhanced by the action of the electric field on the filtering molecules. The electrochromatograph has been used successfully for the purification hepatitis-associated antigen, which is not separated from closely related serum immunoglobulins by either chromatography or electrophoresis. (Modified author abstract)

AD-780 068/3GA Reprint
California Inst of Tech Pasadena Div of Engineering and Applied Science
MECHANICS OF CILIARY LOCOMOTION,
John R. Blake, and Michael A. Sleigh. 6 Aug 73, 43p Rept no. E-97A-30
Contract N00014-67-A-0094-0012, Grant NSF-GK-31161
Prepared in cooperation with Bristol Univ. (England). Dept of Zoology.

Availability: Pub. in Biology Review, v49 p85-125 1974.

Descriptors: *Biomechanics, *Microorganisms, *Cells(Biology), Motion, Fluid dynamics, Fluid flow.
Identifiers: *Cilia, *Locomotor activity.

The fluid movement around a beating cilium is related to the proximity of the cell surface and the presence of other cilia as well as to the length and speed of movement of the cilium and the fluid viscosity. The envelope model and the cilia sublayer model for propulsion of ciliated microorganisms are reviewed and discussed. Further applications of the cilia sublayer model to mucus flows in respiratory tract and fluid flows in tubules of male reproductive tract are mentioned. (Author)

AD-780 234/1GA PC$4.00/MF$1.45
State Univ of New York Brockport Dept of Biology
THE DEGRADATION OF OIL IN CONTINUOUS CULTURE.
Annual rept. no. 1, 1 Sep 72-31 Aug 73,
P. H. Pritchard, and T. J. Starr. 19 Apr 74, 79p
Contract N00014-73-C-0074

Descriptors: *Oils, *Biodeterioration, *Hydrocarbons, Marine biology, Water pollution, Toxicity, Microorganisms, Bioassay, Gas chromatography.
Identifiers: Oil pollution.

A continuous culture system has been developed and tested for its usefulness in studying the degradation of oil and hydrocarbons. Both octane and diesel oil have been degraded in this system at measurable rates. Changes in these substrates and in the bacteria attacking them could be readily monitored and characterized. Oil and hydrocarbons could be degraded without mechanical dispersion and continuous culture enrichments were readily obtained as part of the degradation process. Sequential continuous culture systems have also been developed and tested successfully. An artificial oil has been developed to aid in the study of the bacterial mechanisms for degrading oil. A successful fish embryo bioassay has been developed and it has been shown that water extracts of oil and toluene interfere with embryological development. Oil degradation products also interfere with development but in a different manner. (Author)

AD-780 346/3GA Not available NTIS
Defence Standards Labs Maribyrnong (Australia)
AIR SPORA OF A SITE IN TROPICAL QUEENSLAND, AUSTRALIA,
F. J. Upsher, and D. A. Griffiths. 12 Apr 73, 10p
Prepared in cooperation with La Trobe Univ., Victoria (Australia). Dept. of Botany.
Availability: Pub. in Transactions of the British Mycological Society, v61 n3 p537-545 1973.

Descriptors: *Fungi, *Spores, Microorganisms, Culture media, Airborne, Australia, Incubation, Cultures(Biology), Microbiology.
Identifiers: Queensland(Australia), *Air sampling.

The 'exposed plate' method was used to trap airborne fungal spores in the open and in the jungle at Joint Tropical Research Unit (J.T.R.U.) at Innisfail, Queensland, over a period of three years. One hundred and nineteen genera were recorded and distinct seasonal and diurnal variation was observed in the more common ones. Spores of Cladosporium were more frequently trapped than any other genus at the cleared site and in the jungle. Curvularia, Geotrichum, Leptosphaerulina, Monilia, Penicillium and Nigrospora were also abundant and several other genera, including Aureobasidium, Fusarium, Paecilomyces and Periconia, were often present. The use of quantitative alginate filtration during the final year supplemented the exposed-plate data, but differences in the technique prevented close comparison of the results.

COO-2161-19 PC$6.25/MF$1.45
Wisconsin Univ., Madison (Usa). Dept. Of Bacteriology.
MICROBIOLOGY OF THERMALLY POLLUTED ENVIRONMENTS. TECHNICAL PROGRESS REPORT, AUGUST 1, 1973–JULY 31, 1974.
T. D. Brock. 1 Apr 74, 63p
Contract AT(11-1)-2161

Descriptors: (*Microorganisms, *Growth), (*Thermal pollution, *Biological effects), (*Aquatic ecosystems, *Geothermal energy), (*Environment, Thermal pollution), Animals, Bacteria, Ecology, Plants, Temperature dependence, Thermal effluents, Water, Water pollution.

For abstract, see NSA 29 12, number 29412.

PATENT-3 228 855 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR A MICROBIAL POLYSACCHARIDE.
Patent, *Filed 24 Oct 63, patented 11 Jan 66,
Martin C. Cadmus, and Ralph F. Anderson. 11 Jan 66, 8p PAT-APPL-318 769,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polysaccharides, *Thickeners, *Fermentation, Uronic acids, Viscosity, Solutions, Bacteria, Biosynthesis, Glucose, Galactose, Aerobic processes.
Identifiers: PAT-CL-195-31, Arthrobacter.

The invention relates to a novel microbial polysaccharide, aqueous solutions of which display unique viscosity characteristics that make the edible polymer particularly advantageous as a thickening agent broadly and as an additive for oil well drilling fluids and foodstuffs in particular. More particularly this invention relates to the production in commercially acceptable yields of a novel water-soluble uronic acid polysaccharide, the constituent sugars of which are glucose and galactose, by fermenting heretofore unclassified microorganism belonging to the genus Arthrobacter under aerobic conditions for three to four days in a medium comprising carbon and restricted nitrogen sources, as well as, preferably, trace amounts of manganese in addition to obligatory amounts of magnesium ion.

PATENT-3 282 795 Not available NTIS
Department of Agriculture, Washington, D.C.
PRODUCTION OF 2-KETOGLUCONIC ACID BY 'SERRATIA MARCESCENS.'
Patent, *Filed 5 Oct 64, patented 1 Nov 66,
Theressa J. Misenheimer. 1 Nov 66, 2p PAT-APPL-401 742,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Biosynthesis, *Fermentation, Glucose, Calcium carbonates, Serratia marcescens, Bacteria.
Identifiers: PAT-CL-195-47, Serratiamarcescens, *Hexulosonic acid/arabino.

The invention relates to an improved process for preparing 2-ketogluconic acid by microbiological means. More specifically, this invention relates to a remarkably rapid process for the production of essentially quantitative yields of 2-ketogluconic acid employing the organism Serratia marcescens. 2-ketogluconic acid, is used widely as an intermediate for the production of isoascorbic acid. A strongly aerobic fermentation in a buffered medium optimally containing 10 to 12 percent glucose, 3 percent $CaCO_3$, as well as nitrogenous and trace metal sources provides substantially theoretical yields of 2-ketogluconic acid in the form of its calcium salt.

PATENT-3 360 441 Not available NTIS
Department of Agriculture, Washington, D.C.
MICROBIOLOGICAL SCREENING PROCESS FOR AFLATOXIN.
Patent, *Filed 16 Sep 65, patented 26 Dec 67,
Harland R. Burmeister. 26 Dec 67, 2p PAT-APPL-487 933,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Toxins and antitoxins, *Patents, Fungi, Bacillus megaterium, Assaying, Microbiology.
Identifiers: *Aflatoxins, PAT-CL-195-103-5, Bacillus brevis, Aspergillus flavus.

The invention relates to a microbiological screening test for aflatoxin. More particularly it relates to the useful discovery that cultures of Bacillus megaterium, B. megaterium, and B. brevis are inhibited by the presence of only two micrograms to about ten micrograms of aflatoxin per milliliter of culture substrate.

PATENT-3 396 082 Not available NTIS
Department of Agriculture, Washington, D.C.
GLUCAN PRODUCTION BY FERMENTATION OF FLESHY FUNGI.
Patent, *Filed 9 Jun 65, patented 6 Aug 68,
Edwin N. Davis, Robert A. Rhodes, and Lowell L. Wallen. 6 Aug 68, 2p PAT-APPL-462 760,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Fermentation, *Fungi, *Polysaccharides, Biosynthesis, Glucose.
Identifiers: *Glucans, PAT-Cl-195-31, Helotium, Plectania.

This invention pertains to a process that provides extensive exocellular productions of beta-1,3-gluman-type polymers by specific higher fungi. Excellent yield of beta-1,3-glucan polysaccharides are obtained by fermenting mycelium of certain fungi classified as species of Helotium and Plectania under aerobic conditions in a tap water medium initially containing about 4% by weight of an assimilable mono- or disaccharide and 0.5 percent by weight of defatted soy flakes, and harvesting the so produced destructable glucan very soon after the disappearance of the nutrient sugar.

6O. Pharmacology

AD-780 123/6GA PC$3.25/MF$1.45
Louisville Univ Ky School of Medicine
CORRELATION OF ANIMAL, CRYPT AND STEM CELL SURVIVAL IN FISSION NEUTRON IRRADIATED MICE. A CHEMICAL PROTECTION STUDY.
Annual rept.,
Curtis P. Sigdestad. 1 Nov 73, 42p
Contract DADA17-72-C-2038
See also report dated Nov 72, AD-758 921.

Descriptors: *Radioprotective agents, *Drugs, Fission neutrons, X rays, Gastrointestinal system, Hemopoietic system, Cells(Biology), Bioassay, Laboratory animals.

The report deals with continuing studies with the antiradiation drugs WR2721, WR638, WR1607, WR2347, WR3689, WR77913, and WR109342. In addition, WR2822, WR2823 and WR168643 were added to the experimental protocol. These newly synthesized drugs were compared to the older radiation protection compounds MEA and AET. The effects of high energy x-rays and fission neutrons was tested on intestinal crypt survival, lethality, and total and percrypt cellularity. (Author)

PAT-APPL-446 896 PC$4.75/MF$1.45
Department of Health, Education, and Welfare. Bethesda, Md. Patent Branch.

METHOD FOR THE PREPARATION OF OXYGENATED BENZO(C) PHENANTHRIDINE COMPOUNDS.
Patent Application,
Kwang Yuen Zee-Cheng, and Chia-Chung Cheng.
28 Feb 74, 33p DHEW-K-3-74
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Antineoplastic agents, Heterocyclic compounds with 1 N, Polycyclic compounds, Synthesis(Chemistry), Leukemia.
Identifiers: *Nitidines.

The invention relates to a practical method for the synthesis of nitidine and related oxygenated benzo(c)phenanthridine compounds. This invention further relates to the preparation of new compounds related to nitidine. Nitidine chloride as well as 5,6-dihydro-6-methoxynitidine are highly cytotoxic and display anti-leukemic activity against mouse leukemia P-388 and L-1210 in mice.

TT-73-54019 PC$3.00
Department of Agriculture, Washington, D.C.
THE EFFECT OF THE ANTIFUNGAL ANTIBIOTIC SUBSTANCE FROM STREPTOMYCES SP. NO. 121 ON THE PHYSIOLOGY OF YEASTS (WPLYW PRZECIWDROZDZOWEJ SUBSTANCJI ANTYBIOTYCZNEJ ZE SZCZEPU STREPTOMYCES SP. NR. 121 NA PROCESY FIZJOLOGICZNE DR OZDZY),
Isabela Szajer. 1974, 14p
Trans. of Marie Curie-Skodowska Univ. Annales (Poland) Sec-C v23 n5 p45-57 1968, by Zdzislaw Markiewicz. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Antibiotics, *Fungicides, *Yeasts, Dosage, Fungi, Candida, Saccharomycetes, Poland, USSR, Oxygen, Respiration, Glucose, Fermentation, Inhibition.

The effect of the investigated antibiotic substance was inhibitory against four out of five tested yeast strains - Saccharomyces cerevisiae strain As, Sacch. cerevisiae var. ellipsoideus strain Tokay 22, Kloeckera apiculata and Schizosaccharomyces acidodevoratus. The antibiotic at the concentration 150 microgram/ml had a fungicidal effect on the mentioned yeast strains while at the concentration of 75-100 microgram/ml its effect was fungistatic. Fungistatic doses inhibited glucose fermentation. The same doses markedly stimulated the assimilation of sugar and oxygen respiration in the investigated yeast strains. The pathogenic Candida albicans strain proved to be resistant to the antibiotic even at a concentration of 1000 microgram/ml.

6P. Physiology

AD-780 041/0GA PC$3.25/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
APPLIED PHYSIOLOGY AT EDGEWOOD ARSENAL, 1947-1973-A BIBLIOGRAPHY.
Special pub.,
Francis N. Craig. May 74, 36p Rept no. EB-SP-74005

Descriptors: *Bibliographies, *Physiology, *Stress(Physiology), Indexes, Clinical medicine, Biomedicine.

The report is a bibliography of research reported by members of the Applied Physiology Group (variously known over the years as Applied Physiology Branch or Section and now a part of Medical Physiology Branch, Biomedical Laboratory, Edgewood Arsenal) since 1947. It includes an author index and a subject index. (Author)

AD-780 057/6GA PC$3.00/MF$1.45
Naval Submarine Medical Research Lab Groton Conn
THE CONTRIBUTION OF THE POORER EAR TO BINAURAL INTELLIGIBILITY.
Interim rept.,
J. Donald Harris, and Cecil K. Myers. 1 Feb 74, 15p Rept no. NSMRL-768

Descriptors: *Audiometry, *Auditory perception, Hearing, Speech recognition, Naval personnel.
Identifiers: *Auditory defects, *Binaural hearing.

With 253 normal-hearing Navy enlisted men examined in groups of 20 or fewer, speech reception was tested on a sentence intelligibility test masked by voices coming seemingly from R and L (by the stereophonic illusion; this is the well-known 'cocktail party' effect). Performance was not affected until the input to one ear was reduced by 25+ dB re the other ear. This rejection criterion of 25+ dB was corroborated on 92 patients with audiometric asymmetries. If this criterion is also found on other binaural tasks now being considered in this Laboratory, it will support a recommendation to exclude those with such asymmetries from certain Navy duties. (Author)

AD-780 060/0GA PC$3.00/MF$1.45
Naval Submarine Medical Research Lab Groton Conn
EFFECTS OF REPETITION AND DARK ADAPTATION ON VISUAL EVOKED RESPONSES IN THE RAT.
Interim rept.,
Raymond T. Bartus, and Steven H. Ferris. 1 Feb 74, 14p Rept no. NSMRL-770

Descriptors: *Hyperbaric conditions, *Habituation learning, *Central nervous system, Behavior, Electrophysiology, Stress(Physiology), Psychophysiology, Rats, Experimental data.
Identifiers: *Visual evoked responses, *Evoked responses, Dark adaptation, Neurophysiology.

Rats chronically implanted with monopolar electrodes in the primary visual cortex were used to evaluate progressive changes occurring in the amplitude of visual evoked responses to repeated visual stimuli. It was found that if the rats were dark-adapted prior to testing, no consistent changes occurred in the early components of the evoked response. Without sufficient dark adaptation however, progressive increases in these components were observed. Contrary to these changes, the later evoked response components exhibited reliable changes over trial blocks regardless of whether prior dark adaptation was given. It was concluded that these later-component changes are best explained as correlates of central nervous system habituation. These data may be taken into account in hyperbaric experiments in which the averaged evoked response is used as a measure of neural functioning, thus often alleviating the need for certain costly control conditions; they may provide an additional tool for research programs interested in assessing the effects of hyperbaric environments on simple neurobehavioral processes. (Author)

AD-780 239/0GA PC$3.00/MF$1.45
Oklahoma Univ Health Sciences Center Oklahoma City Dept of Physiology and Biophysics
EFFECTS OF CORONARY HYPOTENSION ON MYOCARDIAL SUBSTRATE UTILIZATION.
Technical rept.,
J. J. Spitzer, A. A. Bechtel, L. T. Archer, M. R. Black, and L. J. Greenfield. 1 May 74, 19p Rept no. TR-86
Contract N00014-68-A-0496

Descriptors: *Hypotension, *Heart, *Metabolism, Oxygen consumption, Blood flow, Blood pressure, Biochemistry, In vitro analysis, Dogs, Experimental data.
Identifiers: *Pathophysiology.

Changes in myocardial substrate utilization were studied following experimental coronary hypotension in the isolated heart of a small dog perfused with the blood of a large donor animal. Prolonged severe hypotension caused a decreased coronary sinus blood flow and myocardial oxygen consumption as well as a relative preference of FFA oxidation and diminished lactate and glucose uptake by the myocardium. It is concluded that the changes of myocardial substrate utilization were quite different following prolonged coronary hypotension from those obtained during experimental hemorrhagic or endotoxic shock. (Modified author abstract)

AD-780 304/2GA Not available NTIS
International Society of Biorheology New York
BIORHEOLOGY - THE OFFICIAL JOURNAL OF THE INTERNATIONAL SOCIETY OF BIORHEOLOGY. VOLUME 10, NUMBER 2, JUNE 1973.
Final rept.,
Alfred L. Copley, and G. W. Scott Blair. Jun 73, 204p
Contract N00014-72-C-0511
Availability: Paper copy available from Pergamon Press, Maxwell House, Fairview Park, Elmsford, N.Y. 10523 $3.75.

Descriptors: *Rheology, *Periodicals, *Meetings, Fluid flow, Fluid dynamics, Body fluids, Information theory, Cybernetics, Fibrinogen, Connective tissue, Cytoplasm, Plants(Botany), Cells(Biology).
Identifiers: *Biorheology.

Contents:
- Biorheology as an organized science;
- On biorheology;
- The Aharon Katchalsky Memorial Lecture—'Life, flow and deformation';
- Biorheology, information theory and cybernetics;
- The dynamic rigidity of fibrin gels;
- Biorheology of soft tissues;
- The use of mechanical tests in determining the structure of connective tissues;
- Dynamics of cytoplasmic streaming in a plant cell.

AD-780 322/4GA Not available NTIS
Defence and Civil Inst of Environmental Medicine Downsview (Ontario)
EFFECT OF INTERNAL PHASE ON FREQUENCY AND AMPLITUDE DISCRIMINATION.
Research paper,
G. Bruce Henning. 28 Dec 72, 20p Rept no. DCIEM-RP-807
Revision of report dated 12 Jul 72.
Availability: Pub. in Jnl. of the Acoustical Society of America, v54 n5 p1160-1178 1973.

Descriptors: *Auditory perception, Frequency, Amplitude, Discrimination, Noise(Sound), Auditory signals, Psychophysiology, Mathematical models, Canada.
Identifiers: *Binaural hearing, *Auditory masking.

The resolution of frequency and amplitude is better at low signal-to-noise ratios with out-of-phase signals than with in-phase signals when the noise in which the signals are presented is the same at both ears. On the other hand, at high signal-to-noise ratios, the effects of the interaural phase of the signals are negligible. These findings are discussed in terms of the predictions of a modified version of Durlach's Equalization and Cancellation Model and the Webster-Jeffress Model of the binaural masking level difference. (Author)

ORO-1643-119 PC$5.00/MF$1.45
Tennessee Univ., Memphis (Usa). Dept. Of Physiology and Biophysics.
STUDIES IN IODINE METABOLISM. PROGRESS REPORT, JUNE 1973--MARCH 1974. MODIFICATION NO. 22.
L. Van Middlesworth. 1974, 40p
Contract AT(40-1)-1643

Descriptors: (*Radium, *Radiation monitoring), (*Iodine, *Metabolism), (*Triiodothyronine,

*Radioimmunoassay), Barium, Cattle, Colorado, Sulfur, Thyroid, Rats, Feces, Man, Animals, Fallout, Iodine 131, Radioactivity.

For abstract, see NSA 29 12, number 29921.

ORO-4106-12 PC$4.25/MF$1.45
North Carolina Univ., Chapel Hill (Usa). School of Medicine.
HORMONALLY-INDUCED DAILY FLUCTUATIONS IN PLASMA CALCIUM AND PHOSPHATE CONCENTRATIONS IN THE RAT.
R. V. Talmage, J. H. Roycroft, and J. J. B. Anderson. 1974, 22p
Contract AT(40-1)-4106

Descriptors: (*Calcium, *Metabolism), (*Phosphates, Metabolism), Biological effects, Blood plasma, Calcium 45, Chemical composition, Daily variations, Fasting, Food, Hormones, Phosphorus 32, Radionuclide kinetics, Rats, Secretion, Thyrocalcitonin, Thyroidectomy, Tracer techniques.

For abstract, see NSA 29 12, number 29923.

PB-232 617/1GA PC$4.00/MF$1.45
Texas Univ., Austin. Dept. of Chemical Engineering.
PHYSIOLOGICAL TRANSPORT PARAMETERS IN PATIENTS IN PERITONEAL AND HEMODIALYSIS.
Annual rept. no. 1, 11 Jun 73-11 Jan 74,
Robert P. Popovich. 11 Jan 74, 93p AK-1-3-2205
Contract N01-AM-3-2205

Descriptors: *Uremia, *Artificial kidneys, Diffusion, Mass transfer, Transport properties, Cells(Biology), Physiology, Molecular weight, Solutes, Mathematical models, Simulation, Evaluation, Patients.
Identifiers: *Hemodialysis, *Metabolites, *Peritoneal dialysis.

The primary objective of the research is to obtain a fundamental understanding of the intercompartmental mass transfer characteristics of chronic uremic patients, to elucidate concomitant peritoneal and hemodialyzer extraction rate limitations in terms of metabolite molecular weight and to define optimum peritoneal dosage cycles and hemodialysis schedules. Comprehensive metabolite transport models have been developed for the peritoneal and hemodialysis patient-artificial kidney systems. Preliminary results indicate that inner body mass transfer resistances are important to metabolite removal in the patient-artificial kidney transport system: a single pool patient transport model is inadequate to describe transfer kinetics. Also, optimum peritoneal dialysis dosage schedules indicate that commercial dialysate solution is being under utilized with current protocols.

6Q. Protective Equipment

COM-74-11075/0GA PC$9.50/MF$1.45
Gillette Co. Research Inst., Rockville, Md. Harris Research Labs. Dept.
USE TYPE TESTS FOR COMFORT AND EFFECTIVENESS OF FIREMEN'S TURNOUT COATS,
Norman R. S. Hollies, Lyman Fourt, George Arnold, and Nancy Custer. 10 Nov 73, 129p NBS-GCR-74-25
Contract C-2-35929

Descriptors: *Protective clothing, *Fire protection, *Human factors engineering, Stress(Physiology), Overcoats, Uniforms, Thermal insulation, Metabolism, Anthropometry, Tests, Temperature control.

The report describes five tests involving the interaction between a fireman's turnout coat and the fireman working in it. The amount of replication necessary to establish major recognizable differences in present designs is ascertained, together with the standard deviation of typical groups of measurements. The man-hours of subjects and observers required to carry out such comparisons are reported. The tests include the metabolic cost of clothing, rate of mixing of air in spaces inside the coat with outside air, thermal insulation of clothing while being worn, effect of clothing on sweat production and evaporation, and the water uptake by clothing worn under the spray of a fog nozzle.

COO-2831-2 PC$4.00/MF$1.45
Michigan Univ., Ann Arbor (Usa).
RADIOPHARMACEUTICALS FOR DIAGNOSIS AND TREATMENT. A.E.C. COMPETING RENEWAL, 1974.
W. H. Beierwaltes. 1974, 13p

Descriptors: (*Neoplasms, *Radiotherapy), (*Carbon 14, *Tissue distribution), (*Iodine 131, Tissue distribution), (*Tritium, Tissue distribution), Animals, Antibiotics, Bleomycin, Cholesterol, Copper 64, Diagnostic techniques, Dopamine, Estradiol, Isomeric nuclei, Labelled compounds, Lecithins, Linoleic acid, Nuclear medicine, Oleic acid, Organic iodine compounds, Patients, Radionuclide administration, Radionuclide kinetics, Radiopharmaceuticals, Scintiscanning, Technetium 99, Testing, Uptake.

For abstract, see NSA 29 12, number 29917.

6R. Radiobiology

AD-780 072/5GA Reprint
Utah Univ Salt Lake City Microwave Device and Physical Electronics Lab
RATE EFFECTS IN ISOLATED TURTLE HEARTS INDUCED BY MICROWAVE IRRADIATION.
Technical rept.,
James L. Lords, Carl H. Durney, Alan M. Borg, and Charles E. Tinney. 9 Aug 73, 6p
Contract N00014-67-A-0325-0009
Revision of report dated 25 May 73.
Availability: Pub. in IEEE Transactions on Microwave Theory and Techniques, VMTT-21 n12 p834-836 Dec 73.

Descriptors: *Heart, *Radiation effects, *Arrhythmia, Irradiation, Microwaves, In vitro analysis, Reptiles, Experimental data.
Identifiers: *Microwave radiobiology.

Continuous 960-MHz microwave irradiation of isolated poikilothermic hearts in Ringer's solution causes bradycardia, in contrast to the tachycardia usually produced by generalized heating. The effect appears to occur only over a narrow power range in the neighborhood of an estimated three mW absorbed by the heart. It is hypothesized that the bradycardia is produced by stimulation of the nerve remnants in the heart. (Author)

AD-780 222/6GA PC$4.00/MF$1.45
Naval Weapons Lab Dahlgren Va
BIOMEDICAL ASPECTS OF NONIONIZING RADIATION.
Technical rept.,
William C. Milroy. Mar 74, 98p* Rept no. NWL-TR-3110

Descriptors: *Meetings, *Radiobiology, Radiation effects, Bioengineering, Electromagnetic radiation, Microwaves, Radiation dosage.
Identifiers: *Nonionizing radiation.

The report consists of the proceedings of a one-day Symposium on Biomedical Aspects of Nonionizing Radiation held on 10 July 1973 at the Naval Weapons Laboratory, Dahlgren, Virginia in conjunction with the opening and dedication of the new Biomedical Research Laboratory. It includes a compilation of six invited papers presented at the Symposium by leading authorities in the fields of bio-engineering, comparative biology, human exposure factors, high power pulses, and EMP bioeffects. (Author)

AD-780 226/7GA PC$3.25/MF$1.45
Naval Aerospace Medical Research Lab Pensacola Fla
MICROWAVE REFLECTION, DIFFRACTION AND TRANSMISSION STUDIES OF MAN.
Medical research projects rept. no. 2,
Vernon R. Reno. 7 Feb 74, 46p* Rept no. NAMRL-1199

Descriptors: *Microwaves, Radiation, Electromagnetic fields, Energy, Distribution, Reflection, Wave propagation, Radiation effects, Low intensity, Humans, Anatomy, Models.
Identifiers: *Microwave radiobiology, Energy dissipation, Energy absorption, Phantoms.

A systematic, detailed description of the spatial energy distribution in microwave fields in proximity to man is provided for the first time. Graphic information is provided to demonstrate the effects on the energy distribution of different radiation parameters such as frequency and polarization and of the ratio of subject size to wavelength. The field patterns obtained with man are compared to theoretical studies of simpler objects available in the literature. The information obtained in the present studies is immediately applicable to hazard evaluations and to the design of bioeffect investigations. The most significant benefit of the approach is in the potential for development of a new, noninvasive method for estimating the energy absorbed by man or animals from an incident microwave field. (Modified author abstract)

AEC-tr-7481 PC$5.45/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France).
IODINE METABOLISM IN CHILDREN AND ADOLESCENTS IN AN AREA OF THE COMMUNITY.
L. Karhausen. Mar 73, 140p
Translation of EUR--4864.

Descriptors: (*Thyroid, *Radionuclide kinetics), (*Iodine 131, *Metabolism), (*Iodine 125, Metabolism), Adolescents, Age groups, Biological models, Children, Data, Dosimetry, European communities, Growth, Icrp, Infants, Radiation protection, Recommendations, Safety standards, Uptake, Urine.

For abstract, see NSA 29 12, number 29851.

AEC-tr-7523 PC$7.60/MF$1.45
RADIOBIOLOGY AND RADIOECOLOGY OF FARM ANIMALS.
B. N. Annenkov, I. K. Dibobes, and R. M. Aleksakhin. 1973, 221p
Translation of Radiobiologiya i radioekologiya sel'skokhozyaistvennykh zhivotnykh, Atomizdat, Moscow, 1973.

Descriptors: (*Radioisotopes, *Metabolism), (*Food chains, *Radionuclide migration), (*Domestic animals, *External irradiation), (*Radioecology, *Reviews), Agriculture, Education, Forage, Manuals, Radiobiology, Radioecological concentration, Radionuclide kinetics, Ussr.

For abstract, see NSA 29 12, number 29863.

BNWL-SA-4789 PC$3.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
BIOLOGICAL EFFECTS OF DAILY INHALATION OF RADON AND ITS SHORT-LIVED DAUGHTERS IN EXPERIMENTAL ANIMALS.
R. F. Palmer, B. O. Stuart, and R. E. Filipy. 1972, 26p CONF-730915-14
Contract AT(45-1)-1830

Descriptors: (*Radon, *Inhalation), (*Uranium ores, Inhalation), (*Lungs, *Biological effects), Bronchi, Daughter products, Dusts, Fibrosis, Hamsters, Mice, Mortality, Pathology, Pneumonitis, Rats, Respiratory system, Trachea.

For abstract, see NSA 29 12, number 29846.

BNWL-SA-4864 PC$3.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
USE OF FISSION PRODUCT NUCLEAR DATA IN LIFE SCIENCES.
E. L. Alpen. 5p CONF-731133-2

Descriptors: Data compilation, Dose rates, Environment, External irradiation, Fission products, Human populations, Internal irradiation, Personnel, Radiation doses, Radiation protection, Radiation sources, Radioisotopes, Radionuclide kinetics, Radionuclide migration, Toxicity, Tracer techniques.

For abstract, see NSA 29 12, number 29837.

CEA-CONF-2466 PC$4.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. De Protection.
STUDY OF EXCHANGEABLE RADIOSTRONTIUM IN RATS. COEXISTENCE OF TWO GROUPS OF BONE FORMS: DIFFUSIBLE AND NONDIFFUSIBLE.
M. J. Maillard. 1973, 19p CONF-730989-2
In French.

Descriptors: (*Strontium 85, *Retention), (*Bone tissues, *Radionuclide kinetics), Contamination, Excretion, Feces, Metabolism, Rats, Renal clearance, Tissue distribution, Urine.

For abstract, see NSA 29 12, number 29864.

CEA-CONF-2542 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
STUDY OF THE TRANSLOCATION OF RADIOSTRONTIUM FROM WOUNDS AND THERAPY BY LOCAL INSOLUBILIZATION.
R. Ducousso, A. Causse, and C. Pasquier. 1973, 4p CONF-730907-20

Descriptors: (*Strontium 85, *Skin absorption), (*Skin, *Decontamination), (*Blood, *Radionuclide kinetics), (*Skeleton, Radionuclide kinetics), Aqueous solutions, Contamination, Detergents, Dtpa, Macacus, Solubility, Therapy, Translocation, Uptake, Wounds.

For abstract, see NSA 29 12, number 29865.

CEA-CONF-2543 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. De Protection.
STUDY OF PURIC AND PYRIMIDIC COMPOUNDS IN URINE OF RABBITS AND RATS AFTER IRRADIATION.
C. Valle, G. Pepin, F. Duprey, and L. Breuil. 6p CONF-730907-24

Descriptors: (*Biological radiation effects, *Metabolism), (*Nucleic acids, Metabolism), (*Hippuric acid, *Excretion), (*Uric acid, Excretion), Feces, Gamma radiation, Lethal irradiation, Rabbits, Rats, Renal clearance, Urine, Whole-body irradiation.

For abstract, see NSA 29 12, number 29791.

CEA-N-1678 PC$5.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France). Dept. De Protection.
GONAD INVOLUTION IN RATS AFTER EXP 60 CO AND NEUTRON IRRADIATION.
G. Lemaire, and G. Grillon. Nov 73, 37p
In French.

Descriptors: (*Neutrons, *Rbe), (*Testes, *Biological radiation effects), Biological models, Dose-response relationships, Gamma radiation, Gonads, Photon beams, Rats.

For abstract, see NSA 29 12, number 29792.

CERN-74-3 PC$4.00/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
ANALYSIS OF THE WEIGHT LOSS OF MOUSE TESTICLES AFTER IRRADIATION WITH NEUTRONS AT 14 AND 400 MEV.
J. M. Laurent. 24 Feb 74, 15p
In French.

Descriptors: (*Testes, *Biological radiation effects), (*Fast neutrons, *Rbe), Mev range 10-100, Mev range 100-1000, Mice, Photon beams, Weight, X radiation.

For abstract, see NSA 29 12, number 29793.

CONF-740303-1 PC$3.75/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ULTRAVIOLET-INACTIVATION OF CONIDIA FROM HETEROKARYONS OF NEUROSPORA CRASSA CONTAINING UV-SENSITIVE MUTATIONS.
M. D. Shelby, F. J. de Serres, and G. J. Stine. 1973, 35p

Descriptors: (*Conidia, *Inactivation), (*Neurospora, Mutations), (*Mutations, *Radioinduction), Biological radiation effects, Photon beams, Radiosensitivity, Ultraviolet radiation.

For abstract, see NSA 29 12, number 29679.

COO-2085-7 PC$4.75/MF$1.45
Michigan Technological Univ., Houghton (Usa). Dept. Of Biological Sciences.
EFFECTS OF ACUTE AND CHRONIC GAMMA RADIATION ON CLADONIA SYLVATICA AND PARMELIA SULCATA. PROGRESS REPORT, MARCH 1, 1973--MARCH 30, 1974.
F. H. Erbisch. 1974, 31p
Contract AT(11-1)-2085

Descriptors: (*Lichens, *Biological radiation effects), (*Organic acids, *Chemical radiation effects), External irradiation, Gamma radiation, Morphological changes, Radioinduction, Seasonal variations, Terrestrial ecosystems, Ultrastructural changes.

For abstract, see NSA 29 12, number 29703.

COO-2269-5 PC$4.00/MF$1.45
Utah Univ., Salt Lake City (Usa). Dept. Of Radiology.
KINETIC AND BIOCHEMICAL STUDIES ON TUMOR GROWTH. COMPREHENSIVE PROGRESS REPORT, OCTOBER 1, 1967--APRIL 1, 1974.
L. A. Dethlefsen. 1974, 16p
Contract AT(11-1)-2269

Descriptors: (*Neoplasms, *Growth), (*Tumor cells, Growth), Antigens, Biological radiation effects, External irradiation, Mammary glands, Mice, Response modifying factors, Thymectomy, X radiation, Animal cells, Iodine 125, Labelled compounds, Metabolism, Organic iodine compounds, Tracer techniques, Uridine.

For abstract, see NSA 29 12, number 29794.

CRSSA-BGE-73-2 PC$4.75/MF$1.45
Centre de Recherches du Service de Sante des Armees, 92 - Clamart (France). Div. De Biologie Generale et Ecologie.
IN-VITRO STUDIES OF THE REPAIR OF FRACTURED MAMMAL BONES EXPOSED TO IRRADIATION.
T. -L. Nguyen, J. Drouet, J. Fournie, and M. Kraemer. 1973, 53p
In French.

Descriptors: (*Bone fractures, *Biological repair), (*Bone tissues, *Biological radiation effects), Dose-response relationships, Fibroblasts, In vitro, Mice, Photon beams, Radiation doses, Tissue cultures, X radiation.

For abstract, see NSA 29 12, number 29795.

NP-19973 PC$3.75/MF$1.45
Helsinki Univ. (Finland). Dept. Of Serology and Bacteriology.
EFFECT OF IRRADIATION ON DELAYED HYPERSENSITIVITY AND ANTIBODY FORMATION IN RATS.
R. Visakorpi. 1973, 31p

Descriptors: (*Immune reactions, *Biological radiation effects), (*Skin, Immune reactions), Albumins, Allergy, Antibody formation, Antigen-antibody reactions, Delayed radiation effects, Encephalitis, Injection, Myelitis, Radioimmunology, Rats, Whole-body irradiation, X radiation.

For abstract, see NSA 29 12, number 29796.

ORO-3547 PC$4.00/MF$1.45
Tennessee Univ., Knoxville (Usa). Memorial Research Center and Hospital.
ROLE AND UTILIZATION OF ERYTHROPOIETIN IN STIMULATING ERYTHROPOIESIS. FINAL REPORT.
1973, 8p
Contract AT(40-1)-3547

Descriptors: (*Erythropoietin, *Biological radiation effects), (*Erythropoiesis, Biological radiation effects), (*Oxygen, *Radiosensitivity effects), (*Bone marrow, *Biological effects), Anoxia, Estrogens, Fluorouracils, Globulins, Mice, Miniature swine, Photon beams, Polycythemia, Proteins, Transplants, Urine, Vinblastine, X radiation.

For abstract, see NSA 29 12, number 29797.

RT/BIO-(73)31 PC$4.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
EFFECTS OF HIGH ENERGY RADIATION ON THE LENS IN MICE.
M. Di Paola, M. Bianchi, and J. Baarli. 27 Nov 73, 14p CONF-730587-1
In Italian.

Descriptors: (*Crystalline lens, *Biological radiation effects), (*Neutrons, *Rbe), Accelerators, Mev range 100-1000, Mice, Photon beams, Radiation protection, Radiosensitivity, X radiation.

For abstract, see NSA 29 12, number 29798.

SGAE-2190 PC$4.50/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Forschungszentrum.
INTERNATIONAL SYMPOSIUM ON DNA-REPAIR AND LATE EFFECTS, VIENNA, DECEMBER 6-7, 1973. ABSTRACTS.
Nov 73, 49p CONF-731215-(Absts.)
In English and German.

Descriptors: (*Dna, *Biochemical reaction kinetics), (*Strand breaks, *Radioinduction), Animal cells, Biological radiation effects, Biological repair, Dna replication, Enzymes, Man, Meetings.

For abstract, see NSA 29 12, number 29659.

SGAE-2211 PC$3.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Inst. Fuer Biologie.
ACTION OF 2, 4, 5-TE ON DNA-REPAIR AFTER UV- OR IONIZING RADIATION.
F. Antoni, I. Vincze, W. Klein, and F. Kocsis. Dec 73, 9p

Descriptors: (*Dna, Strand breaks), (*Strand breaks, *Biological repair), (*Alcohols, *Radiosensitivity effects), (*Spleen cells, *Biological radiation effects), Biosynthesis, Gamma radiation, Herbicides, Mice, Organic chlorine compounds, Photon beams, Response modifying factors, Thymidine, Ultraviolet radiation.

For abstract, see NSA 29 12, number 29667.

SGAE-2218 PC$4.00/MF$1.45
Oesterreichische Studiengesellschaft fuer Atomenergie G.M.B.H., Seibersdorf. Inst. Fuer Biologie.
EFFECT OF 2,4-D ON SEMICONSERVATIVE- AND DNA-REPAIR SYNTHESIS (CASE REPORT: BULLOUS DERMATITIS AFTER EXPOSURE TO 2,4-D).
M. J. Balo-Banga, F. Antoni, H. Altmann, I. Vincze, and F. Kocsis. Dec 73, 9p

Descriptors: (*Dna, *Biological repair), (*Herbicides, *Radiosensitivity effects), (*Monocarboxylic acids, Radiosensitivity effects), (*Organic chlorine compounds, Radiosensitivity effects), Animal cells, Biological effects, Biological radiation effects, Biosynthesis, Dermatitis, Gamma radiation, Inhibition, Photon beams, Response modifying factors, Skin, Ultraviolet radiation.

For abstract, see NSA 29 12, number 29668.

SSI-1974-4 PC$4.00/MF$1.45
Statens Seruminstitut, Copenhagen (Denmark).
CESIUM-137 IN A CONTROL GROUP AT THE NATIONAL INSTITUTE OF RADIATION PROTECTION, 1973.
R. Falk, and G. Eklund. Jan 74, 6p
In Swedish.

Descriptors: (*Cesium 137, *Radiation monitoring), (*Man, Radiation monitoring), Biological radiation effects, Contamination, Radiation protection, Sweden, Whole-body counting.

For abstract, see NSA 29 12, number 29852.

TID-26548 PC$3.00/MF$1.45
Tennessee Univ., Knoxville (Usa).
ALTERATIONS INDUCED BY X RAYS AND ULTRAVIOLET LIGHT ON THE SYNTHESIS AND MAINTENANCE OF MACROMOLECULAR COMPONENTS WITHIN CELLS. PROGRESS REPORT, FEBRUARY 1, 1973--MARCH 1, 1974.
D. Billen. 1974, 7p
Contract AT(40-1)-4568

Descriptors: (*Bacillus subtilis, *Biochemical reaction kinetics), (*Dna, *Biological repair), Biological radiation effects, Biosynthesis, Mutants, Nucleotides, Permeability, Photon beams, Polymerases, Ultraviolet radiation, X radiation.

For abstract, see NSA 29 12, number 29681.

TID-26552 PC$5.00/MF$1.45
Usaec Division of Biology and Medicine, Washington, D.C.
PROTECTION AGAINST RADIATIONS FROM CALIFORNIUM-252.
1970, 38p

Descriptors: (*Neutron sources, *Radiation hazards), (*Personnel, *Radiation protection), (*Nuclear medicine, Neutron sources), Californium 252, Fast neutrons, Materials handling, Medical personnel, Radiation source implants, Radiotherapy, Recommendations.

For abstract, see NSA 29 12, number 29755.

UR-3490-384 PC$3.25/MF$1.45
Rochester Univ., N.Y. (Usa). Dept. Of Radiation Biology and Biophysics.
BIOLOGICAL EFFECTS OF RADON ON THE LUNG.
D. A. Morken. 1973, 22p CONF-730915-13

Descriptors: (*Radon, *Biological radiation effects), (*Lungs, Biological radiation effects), (*Alpha sources, Biological radiation effects), (*Polonium isotopes, Biological radiation effects), Alpha decay, Alpha particles, Bismuth isotopes, Bronchi, Daughter products, Dogs, Inhalation, Lead isotopes, Mice, Neoplasms, Pathology, Radiation doses, Radioinduction, Rats, Tissues.

For abstract, see NSA 29 12, number 29847.

6S. Stress Physiology

AD-780 079/0GA Reprint
Philadelphia General Hospital Pa Dept of Biochemistry
THE EFFECT OF COLD ON THE COMPOSITION OF THE PHOSPHOLIPIDS OF THE BLOOD PLASMA OF HEALTHY ATHLETES (37750),
B. D. Polis, E. Polis, H. P. Schwarz, and L. Dreisbach. 14 Jun 73, 5p
Contracts N62269-73-R-0328, N00014-69-C-0154
Availability: Pub. in Proceedings of the Society for Experimental Biology and Medicine, v145 p70-73 1974.

Descriptors: *Lipids, *Stress(Physiology), Glycerols, Blood plasma, Humans, Low temperature.
Identifiers: Athletics, *Phosphatidylglycerols, Phospholipids, *Cold stress.

The phospholipid composition of the blood plasma of nine healthy athletes was examined before and after the subjects were placed in a tank filled with water at 2 degrees. It was found that the phosphatidylglycerol (GPG) content of the plasma was very significantly elevated immediately after and seven min following the exposure to the cold. Only one other phospholipid, phosphatidic acid, showed much lesser elevation of GPG after the subjects left the cold-water tank. All the remaining individual phospholipids and total lipid phosphorus were not affected by the experiment. The possible significance of these changes of GPG in stress are discussed.

AD-780 093/1GA PC$3.00/MF$1.45
Naval Submarine Base New London Groton Conn
EXCRETION OF MINERALS AND NITROGEN METABOLITES FOLLOWING EXPOSURE TO INCREASED AIR PRESSURE (2 OR 7 ATA).
Interim rept.,
Elly Heyder, and Donald V. Tappan. 10 Oct 73, 14p Rept no. NSMRL-765

Descriptors: *Metabolites, *Hyperbaric conditions, *Nitrogen compounds, *Minerals, *Stress(Physiology), Metabolism, Excretion, Electrolytes, Steroids, Divers, Bones, Cartilage.

Urinary minerals, electrolytes, nitrogen metabolites and steroids were measured in Navy divers following exposure to air at 2 and 7 ATA for 45 minutes. Total urinary excretion of osmoles, sodium, potassium, calcium, phosphorus, urea nitrogen, uric acid, creatinine, keto- and ketogenic steroids were depressed below control values during the first day following exposure to either 2 or 7 ATA. The mineral and electrolyte changes are related to reduction in urine volume which may result from an anti-diuretic hormone (ADH) mediated response to hypovolemia induced by dysbaric stress. Although a general rebound effect began to occur by the second post-dive day, a continued depression of uric acid, creatinine, and ketosteroids throughout four days of observation suggests a prolonged period of recovery from diving. Increasing excretion of hydroxyproline for several days by those men exposed to 7 ATA, implies a latent response in the metabolism of cartilage and bone to this stress. (Author)

AD-780 094/9GA PC$3.00/MF$1.45
Naval Submarine Medical Research Lab Groton Conn
URINARY INDICATORS OF STRESS: EFFECTS OF EXPOSURE TO SIMULATED SONAR NOISE FOR 8 TO 23 DAYS.
Interim rept.,
Donald V. Tappan, R. O. Madden, and M. J. Jacey. 15 Oct 73, 16p Rept no. NSMRL-766

Descriptors: *Stress(Physiology), *Noise(Sound), *Confinement(Psychology), *Steroids, *Metabolites, Excretion, Urine, Metabolism, Naval personnel, Submarine personnel.

Studies have been made of the relationships among excretion rates of urinary steroids hormones (indicators of stress) and a variety of other urinary metabolites in healthy young men subjected to mild laboratory-controlled stress of simulated sonar noise and continuous confinement for 8 to 23 days. The objective of the study was to evaluate the stress of an increased noise component in the environment of Naval personnel living on submarines. An approach to the problem has been to utilize orderly means for evaluation of the several kinds of urinary data commonly obtained for stress analysis. Significant correlations among the excreted hormones and accompanying metabolic components make possible an estimation of steroids, and thus of stress from any of several combinations of metabolic data. Using the techniques proposed, it is possible to evaluate stress responses from information more readily available than from the more complex and protracted steroid measurements. (Modified author abstract)

AD-780 150/9GA Reprint
Duke Univ Medical Center Durham N C F G Hall Lab for Environmental Research
ESTIMATE OF MAXIMUM EXPIRATORY FLOW BASED ON THE EQUAL PRESSURE POINT CONCEPT AND WEIBEL'S LUNG MODEL.
James H. Haynes, and Johannes A. Kylstra. Jun 73, 14p
Contract N00014-67-A-0251-0007, Grant PHS-HL-07896
Availability: Pub. in Undersea Biomedical Research, v1 n1 p45-68 p45-58 Mar 74.

Descriptors: *Respiration, *Pressure breathing, *Hyperbaric conditions, Mathematical models, Lung, Divers, Stress(Physiology).

Using empirical flow equations from the engineering literature the authors have calculated expiratory pressure-flow relationships in Weibel's lung model. The computed maximum expiratory flow of air and oxygen-helium mixtures over a range of barometric pressures from 1 to 53 atmospheres was in good agreement with experimentally determined values. It is concluded that a diver's maximum expiratory flow at great depths can be estimated from measurements made at the surface and at shallow depths. (Modified author abstract)

AD-780 153/3GA Reprint
Minnesota Univ Austin Hormel Inst
EFFECT OF HYPERBARIC EXPOSURE AT 9.6 ATA (N2-02) AND FAST DECOMPRESSION ON SPHINGOGLYCOLIPIDS OF RAT LIVER, PLASMA, AND RED BLOOD CELLS,
T. K. Yang, H. M. Jenkin, R. K. Keck, Jr., and R. E. Danziger. Apr 74, 5p
Contract N00014-67-C-0113-0011

Availability: Pub. in Aerospace Medicine, v45 n4 p375-379 Apr 74.

Descriptors: *Hyperbaric conditions, *Fatty acids, Biochemistry, Rats, Liver, Blood plasma, Erythrocytes, Decompression, Stress(Physiology), Lipids, Rats, Experimental data.
Identifiers: *Glycosphingolipids, Glycolipids, Ceramides.

The amount of monoglycosyl ceramides in the plasma of nonsymptomatic and symptomatic animals increased almost two-fold 24 h after surfacing. A decrease in the monoglycosyl ceramide was observed in the red blood cells of nonsymptomatic animals and an increase in the symptomatic animals during the same observation period. Chain elongation of fatty acids of the monoglycosyl ceramides in the rat liver was observed under experimental conditions. The percentage of 22:0 and 24:0 increased at the expense of 16:0 and 18:0 fatty acids. Some changes in the chain length of the fatty acids of tetraglycosyl ceramides were also observed 24 h after surfacing. (Modified author abstract)

6T. Toxicology

AD-780 010/5GA PC$4.50/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
THE TOXICOLOGY OF CYCLOTRIMETHYLENE-TRINITRAMINE (RDX) AND CYCLOTETRAMETHYLENE-TETRANITRAMINE (HMX) SOLUTIONS IN DIMETHYLSULFOXIDE (SMSO), CYCLOHEXANONE, AND ACETONE.
Technical rept. Mar-Sep 70,
Bernard P. McNamara, Harold P. Averill, Edmund J. Owens, John F. Callahan, and David G. Fairchild. Apr 74, 108p* Rept no. EB-TR-73040

Descriptors: *Toxicology, *Explosives, *RDX, *HMX, *Industrial medicine, Solvents, Acetones, Cyclohexanones, Sulfoxides, Exposure(Physiology), Skin(Anatomy), Pharmacology, Sensitivity, Eye, Laboratory animals, Bioassay, Experimental data.
Identifiers: Methyl sulfoxide, Toxic hazards.

A study of the toxicology of the explosives cyclotrimethylene-trinitramine (RDX) and cyclotetramethylene-tetranitramine (HMX) in acetone, cyclohexanone, and pure and technical grade dimethysulfoxide (DMSO) was initiated to establish whether there is any danger to plant personnel that handle such mixtures. The report contains a review of the existing literature on each explosive and on each solvent. It also describes tests that were conducted to establish the intravenous toxicity of the explosives in DMSO, the skin effects, the pharmacological effects, the sensitization potential, and the ocular effects of the explosives in each solvent. All of these tests were conducted on animals. (Modified author abstract)

AD-780 138/4GA Reprint
Armed Forces Inst of Pathology Washington D C
DRUG EXCRETION IN THE URINE OF MILITARY SEPARATEES: A PILOT STUDY.
P. E. Winter, C. J. Stahl, L. R. Goldbaum, and A. M. Dominguez. 4 Oct 73, 9p
Revision of report dated 29 Mar 73.
Availability: Pub. in Jnl. of Forensic Sciences, v19 n2 p317-324 1974.

Descriptors: *Urine, *Excretion, Military personnel, Civilian population, Drugs, Drug addiction, Toxicology.
Identifiers: *Drug abuse.

A pilot study undertaken in February 1971 has provided preliminary data on the prevalence of the urinary excretion of certain drugs of abuse in military separatees and has demonstrated the feasibility of subsequent mass screening of personnel by toxicologic methods. Nearly 2500 samples of urine were collected and examined for morphine, amphetamine, barbiturate, codeine, methadone, meperidine, quinine, and propoxyphene. The demographic characteristics of the sample population are discussed. The study revealed concentrations of one or more drugs in the urine of 66 persons. The drugs codeine, methadone, or meperidine were not found in any of the specimens. Thirty-eight soldiers had morphine in their urine at the time of separation. Thirty-two of these 38 specimens were collected from 894 Army returnees from Vietnam with a prevalence of 3.6 percent among these personnel.

PB-232 544/7GA PC$3.75/MF$1.45
Medical Coll. of Wisconsin, Milwaukee. Dept. of Environmental Medicine.
THE EFFECT OF CARBON MONOXIDE ON TIME PERCEPTION.
Final rept.,
Richard D. Stewart, Paul E. Newton, Michael J. Hosko, and Jack E. Peterson. Jan 73, 54p*
MCOW-ENVM-CO-72-2 CRC-APRAC-CAPA-3-68, EPA-650/1-74-005
Contract EPA-CPA-70-7
See also PB-214 651.

Descriptors: *Carbon monoxide, *Time perception, *Toxicology, Exposure, Thresholds(Perception), Electrocardiography, EDTA, Audiometry.
Identifiers: Carboxylhemoglobin, *Air pollution effects(Humans).

Twenty-seven healthy, adult male and female volunteers were exposed to carbon monoxide at concentrations of < 2, 50, 100, 200 and 550 ppm for periods up to 4 1/2 hours for the purpose of determining the effect of gas upon time perception. These exposures, which resulted in a range of carboxyhemoglobin saturations up to 20%, produced no impairment in the ability of the subject to perform the Beard-Wertheim Time Discrimination Test, to estimate ten or thirty second intervals, or to perform the Marquette Time Estimation Test.

7. CHEMISTRY

7A. Chemical Engineering

GKSS-73-E-28 PC$3.00/MF$1.45
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt M.B.H., Hamburg (F.R. Germany).
MEWAK I: A DESALINATION MATERIALS CORROSION TEST LOOP.
F. Bulda, K. R. Froehner, and F. J. Schmitt. 1973, 15p CONF-730904-6
In several languages.

Descriptors: Brines, Corrosion, Desalination, Design, Materials testing, Medium temperature, Pipes, Shape, Size, Transport, Valves.

For abstract, see NSA 29 12, number 31642.

PAT-APPL-412 222 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
METHOD FOR THE PREPARATION OF HIGHLY PURE TITANIUM TETRACHLORIDE FROM CALCIUM-CONTAINING TITANIUM MATERIALS.
Patent Application,
William A. Stickney, Willard L. Hunter, and Jack C. White. Filed 2 Nov 73, 17p DOCKET/MIN-1519/2229
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Titanium chlorides, *Perovskites, *Patent applications, Calcium.
Identifiers: Carbothermic reduction.

In the patent application calcium-containing titanium ores, such as perovskite, or calcium oxide enriched titania slage are fused with carbon to produce titanium carbide particles within a matrix of calcium carbide. The titanium carbide particles are freed from the fused product by reaction with water and are concentrated by physical means. Chlorination of the titanium carbide concentrate at temperatures below the melting point of impurity metal chlorides yields an extremely pure titanium tetrachloride product.

PATENT-3 763 040 Not available NTIS
Environmental Protection Agency, Washington, D.C.
PROCESSES FOR REDUCING THE ORGANIC-CARBON CONTENT OF WATER CONTAMINATED WITH ORGANIC COMPOUNDS BY CONTINUOUS COUNTERCURRENT MULTISTAGE TREATMENT WITH ACTIVATED CARBON.
Patent, *Filed 13 Aug 71, patented 2 Oct 73, Winifried George Timpe, and Edward Wilkerson Lang. 2 Oct 73, 6p PAT-APPL-171 604,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Activated carbon treatment, *Sewage treatment, *Industrial waste treatment, *Organic compounds, Liquid flow, Paper industry, Flow diagrams, Separation, Waste water, Particle size.
Identifiers: PAT-CL-210-27, Water pollution control, Continuous process methods.

The patent describes processes for the treatment of water that is contaminated with organic compounds. The contaminated water is subjected to a continuous countercurrent multistage treatment with particulate activated carbon in a plurality of tanks in each of which a high slurry density, for example, between 50 and 200 grams per liter of the slurry, is maintained. Particles of activated carbon, intermediate in size between those used heretofore in such processes for the reduction of the organic-carbon content of such wastewaters, are advantageously used in these processes. The processes are particularly useful for rendering industrial wastewaters suitable for reuse.

PB-232 449/9GA PC-GPO/MF$1.45-NTIS
Environmental Protection Agency, Riversville, W. Va. Crown Mine Drainage Control Field Site.
APPLICATION OF REVERSE OSMOSIS TO ACID MINE DRAINAGE TREATMENT.
Environmental protection technology series (Final),
Roger C. Wilmoth. Dec 73, 171p EPA-670/2-73-100 W74-08155
Paper copy available from GPO $2.00 as stock no. EP1.23:670/2-73-100.

Descriptors: *Neutralizing, *Industrial waste treatment, Disinfection, Filtration, Precipitation(Chemistry), Feedwater treatment, Feasibility, Calcium sulfates, Fouling, Performance evaluation.
Identifiers: Spiral wound membranes, *Mine acid drainage, Hollow fiber membranes, Tubular membranes, *Reverse osmosis, Water pollution control.

Spiral-wound reverse osmosis systems were tested on acid mine drainage discharges whose water quality characteristics were quite varied. In addition, comparison studies were made of the hollow-fiber and tubular systems and of the spiral and hollow-fiber systems. At all sites, the limiting factor in high recovery operation was calcium sulfate insolubility. Product water was of near potable quality. Neutralization was required in all cases to elevate pH and, in some cases, to remove residual iron and manganese. A 'neutrolosis' process was developed in the course of these investigations and constituted a major technological advance in reverse osmosis treatment of acid mine drainage. The neutrolosis process, a combination of reverse osmosis and neutralization, achieved water recoveries near 99 percent while producing a high quality product. Pretreatment consisted of ten

micron filtration. Ultraviolet disinfection, acid injection, or both, were sometimes necessary to inhibit iron oxidation and precipitation.

PB-232 695/7GA PC$6.00/MF$1.45
Consolidation Coal Co., Library, Pa. Research Div.
PRODUCTION OF CLEAN FUEL GAS FROM BITUMINOUS COAL.
Final rept.,
G. Curran, J. Clancey, B. Pasek, and M. Pell. Dec 73, 241p* EPA-650/2-73-049
Contract EPA-EHSD-71-15

Descriptors: *Coal gasification, *Desulfurization, Cost estimates, Dolomite(Rock), Regeneration(Engineering), Manufactured gas, Coal gas, Cyclone separators, Dust collectors, Cost analysis, Sorbents, Fluidized bed processing, Engineering drawings, Flow charts, Performance, Bituminous coal.
Identifiers: Low sulfur fuels, Claus process, Particulates.

A process for the production of low-Btu gas from bituminous coals via fluid bed gasification is described. Coal processing consists of pretreatment, gasification, and final burnup. Hot fuel gas is desulfurized with half-calcined dolomite and cleaned of particulates in high-pressure drop cyclones. The sulfur acceptor is regenerated with steam and CO2. A liquid-phase Claus reactor is used to process the H2S in the regenerator offgas into elemental sulfur. Experimental data are presented which demonstrated feasibility of the major process steps. An economic evaluation of gas clean-up operations shows that regenerative use of acceptor is preferable to once-through, and that removal of particulates via cyclones, if feasible, is cheaper than water scrubbing with subsequent reheat. The cost of the gas desulfurization process including sorbent regeneration and sulfur recovery is of the order of 20 cents/MM Btu of product gas. (Modified author abstract)

PB-232 697/3GA PC$13.00/MF$1.45
Mason-Rust, Lexington, Ky.
EVALUATION OF 75,000 GPD CONTINUOUS ION EXCHANGE SEA WATER DESULFATING PILOT PLANT.
Research and development progress rept.,
K. M. Garrison, and J. E. Gugeler. Jan 71, 198p Int-OSW-RDPR-74-964
Contract DI-14-01-0001-2178

Descriptors: *Ion exchanging, *Feedwater treatment, Columns(Process engineering), Barium sulfates, Precipitation(Chemistry), Pilot plants, Desalting, Ion exchange resins, Sea water, Fouling, Process charting, Regeneration(Engineering), Performance evaluation, Cost estimates, Design.
Identifiers: *Desulfating, Multistage flash distillation, Wrightsville Beach desalination plant.

The report evaluates the operational program of a 75,000 GPD Continuous Ion Exchange Desulfating Pilot Plant located at the Office of Saline Water Wrightsville Beach Test Facility for the period July 1969 through November 1970. The Pilot Plant operation included checkout, start-up, operation for gathering of performance data, and operation to furnish feedwater to a Multi-Stage Flash Distillation Pilot Plant. Production of desulfated sea water for use as feedwater permitted Multi-Stage Flash Distillation Plant operation at 350F and a Concentration Ratio of 3.5.

PB-232 698/1GA PC$16.00/MF$1.45
Fluor Corp., Ltd., Los Angeles, Calif.
CONCEPTUAL DESIGN AND COST ESTIMATE OF A VAPOR COMPRESSION VTE/MSF DESALTING PLANT.
Research and development progress rept.,
W. A. Bruinsma, M. E. Marwede, and P. J. Schroeder. Dec 71, 260p Int-OSW-RDPR-74-962
Contract DI-14-30-2956

Descriptors: *Desalting, *Industrial plants, Operating costs, Design, Cost estimates, Prototypes, Gas turbines, Sea water, Capitalized costs, Capacity, Flow charts, Specifications, Engineering drawings, Evaporators.
Identifiers: *Vapor compression distillation, *Multistage flash distillation, *Vertical tube evaporation.

A conceptual design and cost estimate for an 8 MGD prototype gas turbine powered vapor compression VTE/MSF (vertical tube evaporation/multistage flash) desalting plant were prepared. The process consists of a 34 effect MSF, a 4 effect VTE, and 593,200 lb/hr vapor compressor powered by a commercial gas turbine exhausting through a heat recovery boiler. Total capital cost is estimated at $11,840,000, including the desalting plant and sea water intake. Water cost is estimated at $0.59 per 1,000 gallons, assuming a fuel cost of $0.30 per million Btu.

PB-232 699/9GA PC$11.50/MF$1.45
Envirogenics Co., El Monte, Calif.
OPERATION OF THE 16-STAGE MSF PILOT PLANT, 1969-1970.
Research and development progress rept.,
R. N. Webb, G. G. Weth, and C. B. Schutt. Apr 72, 168p Int-OSW-RDPR-74-966
Contract DI-14-01-0001-2240

Descriptors: *Desalting, Performance, Pilot plants, Ion exchanging, Feedwater treatment, Deionization, Alkalinity, pH, Scale(Corrosion), Fouling, Heat transfer, Carbon dioxide, Prevention, Precipitation(Chemistry), Calcium, Magnesium, Sea water.
Identifiers: *Multistage flash distillation, Desulfating.

Operation of the 16-stage pilot plant from July 1969 through December 1970 is discussed. Results are included for testing using desulfated feed, deionized feed, reduced alkalinity, pH control, CO2 scale suppression pilot plant, a plastic film heat exchanger, three brine heaters, cleaning outside of condenser tubes, and the fouling indicator. Highlights include a 350F, 3.5CF, scale-free test with desulfated feed.

PB-232 713/8GA PC$18.00/MF$1.45
Fluor Corp. Ltd., Los Angeles, Calif.
EVALUATION OF THE CAPABILITIES OF THE VERTICAL TUBE EVAPORATOR AND THE MULTISTAGE FLASH DISTILLATION DESALINATION PROCESSES.
Research and development progress rept.,
Sep 69, 299p Int-OSW-RDPR-74-960
Contract DI-14-01-0001-1830

Descriptors: *Desalting, Heat exchangers, Reliability, Comparison, Operating costs, Capitalized costs, Industrial plants, Engineering diagrams, Performance evaluation, Cost estimates.
Identifiers: *Verticle tube evaporation, *Multistage flash desalination.

A contract was awarded to determine, compare and evaluate the relative thermodynamic and engineering characteristics and economics of the Vertical Tube Evaporator (VTE) and the Multistage Flash (MSF) processes. The contract included a determination and assesment of the relative reliability, maintainability, and potentials of the two types of plants. The evaluation is made on both large and small plants of each process. The designs were reviewed and altered where necessary to make the process and engineering design bases the same for each plant. Capital costs and operating costs were determined.

PB-232 715/3GA PC$10.50/MF$1.45
Universal Desalting Corp., New York.
FOURTH REPORT ON HORIZONTAL-TUBE MULTIPLE-EFFECT (HTME) PROCESS PILOT PLANT TEST PROGRAM.
Research and development progress rept.,
C. J. Cannizzaro, J. Z. Karpf, N. Kosowski, and A. S. Pascale. Jul 72, 149p Int-OSW-RDPR-74-967
Contract DI-14-01-0001-2247
See also PB-232 720.

Descriptors: *Desalting, Fluid flow, Design, Heat transfer, Pilot plants, Condensing, Bubbles, Boiling.
Identifiers: Wrightsville Beach Desalination Plant, *Horizontal tube evaporation.

Results of testing of the three-effect HTME Pilot Plant at the Wrightsville Beach Test Facility are reported for the period from May 1971 to January 1972. During this period, additional heat transfer data were obtained. Boiling coefficient on the outside of tubes and condensing coefficient inside of tubes were determined. A correlation was developed for the condensing coefficients. Photographic studies were made to determine the nature of bubble formation and growth on the outside surface of tubes. The variation of heat transfer coefficients across the HTME tube bundle was measured. Increased heat transfer coefficients, obtained at temperatures above 190F, are reported for tubes enhanced on the outside surface. Tests were conducted to determine the effectiveness of the brine distribution system to obtain uniform distribution of brine over the tube bundle, and results are reported comparing the brine distribution above and below a deep tube bundle. (Modified author abstract)

PB-232 720/3GA PC$9.00/MF$1.45
Universal Desalting Corp., New York.
FIFTH REPORT ON HORIZONTAL-TUBE MULTIPLE-EFFECT (HTME) PROCESS PILOT PLANT TEST PROGRAM.
Research and development progress rept.,
J. Z. Karpf, and R. S. Pascale. Dec 72, 117p Int-OSW-RDPR-74-963
Contract DI-14-01-0001-2247
See also PB-232 715.

Descriptors: *Desalting, *Evaporators, Engineering drawings, Performance, Pilot plants, Heat transfer, Fluid flow, Precipitation(Chemistry), Scale(Corrosion), Development, Design.
Identifiers: *Horizontal tube evaporation, Wrightsville Beach Desalination Plant.

Development work in the three-effect HTME evaporator at Wrightsville Beach was continued with studies in several areas of design and operation: comparative heat transfer performance of square-, rectangular-, and triangular-pitch tube bundles, influence of steam inlet passage geometry on local heat transfer performance within the bundle, bundle flooding, and feed distribution within a bundle, performance of an HTME evaporator during alkaline and anhydrite scaling, alkaline scale control, and methods of scale removal.

PB-232 761/7GA PC$9.50/MF$1.45
Envirogenics Co., El Monte, Calif.
DEVELOPMENT PROGRAM AND TEST INSTRUMENTATION FOR VTE/MSF MODULE PLANT, FOUNTAIN VALLEY, CALIFORNIA.
Research and development progress rept.
Oct 71, 129p Inst-OSW-RDPR-74-965
Contract DI-14-30-2788

Descriptors: *Desalting, *Distillation equipment, Evaporators, Prototypes, Pilot plants, Engineering drawings, Process charting, Development, Tests.
Identifiers: *Vertical tube evaporation, *Multistage flash distillation.

The Office of Saline Water and the Orange County Water District have undertaken the construction and operation of a prototype VTE/MSF (Vertical tube evaporator/multi-stage flash distillation) plant at Fountain Valley, California, with an ultimate capacity of 12.5 MGD. The initial plant will be modular in nature and will consist of 4 vertical tube effects and a 5 flash stage feed heater, with a capacity of 3.0 MGD. The development program, and testing and test instrumentation are described.

PB-232 762/5GA PC$8.25/MF$1.45
Fluor Corp. Ltd., Los Angeles, Calif.
CONCEPTUAL DESIGN AND COST ESTIMATE 2.5 MGD DIRECT CONTACT CONDENSATION MULTISTAGE FLASH DESALINATION PLANT.
Research and development progress rept.,
M. E. Marwede, and P. J. Schroeder. Jan 72, 103p
Int-OSW-RDPR-74-961
Contract DI-14-01-0001-1286

Descriptors: *Dasalting, Pilot plants, Condensing, Water treatment, Engineering drawings, Design, Cost estimates, Capitalized costs, Operating costs, Condensers(Liquefiers), Performance, Mathematical models, Heat exchangers, Capacity.
Identifiers: *Multistage flash desalination, Direct contact condensation.

The conceptual design and costs of a 2.5 MGD Direct Contact Condensation Multistage Flash Desalination Plant (DCC-MSF) were determined. The study indicated that the process is competitive with other processes such as VTE upflow or VTE downflow plants. Product water was estimated to cost $0.86 per 1000 gallons. Further testing of plant components are recommended. (Modified author abstract)

PB-232 985/2GA PC$3.75/MF$1.45
National Materials Advisory Board (NAS-NAE), WWashington, D.C.
A SEMI-DELPHI EXERCISE ON SUBSTITUTE CATALYSTS FOR PLATINUM IN AUTOMOBILE EMISSION CONTROL DEVICES AND PETROLEUM REFINING.
Final rept.
Mar 74, 53p NMAB-314
Contract GS-00-DS-(P)-85005
Report from Committee on Technical Aspects of Critical and Strategic Materials. Sponsored in part by Bureau of Mines, Washington, D.C., and Department of Commerce, Washington, D.C.

Descriptors: *Air pollution control equipment, *Catalysts, Scenarios, Reviews, Questionnaires, Petroleum refining, Catalytic converters.
Identifiers: *Catalytic reactors(Exhaust systems), Automobile exhaust, *Delphi technique.

A brief state of the art on base metal catalysts for automobile emission control devices and petroleum refining is presented. Possible scenarios, after the introduction of the first generation of emission control devices containing platinum, are presented along with suggested areas for research in base metal and platinum catalysts. Factors that could affect the requirements for automobile exhaust catalysts also were developed. The format utilized involved summarizing the responses to an iteration of pertinent questions, followed by a workshop.

7B. Inorganic Chemistry

AD-780 054/3GA PC$3.75/MF$1.45
Army Medical Bioengineering Research and Development Lab Aberdeen Proving Ground Md
THE EVALUATION OF EXISTING FIELD TEST KITS FOR DETERMINING FREE CHLORINE RESIDUALS IN AQUEOUS SOLUTIONS.
Final technical rept.,
William J. Cooper, Eugene P. Meier, Jerry W. Highfill, and Charles A. Sorber. Apr 74, 51p* Rept no. TR-7402

Descriptors: *Chlorine, *Colorimetric analysis, Test equipment, Test methods, Field tests, Chemical agents, Performance(Engineering).
Identifiers: Water analysis, Performance evaluation, SNORT(Stabilized Neutral Orthotolidine Test), Syringaldazine, Phenylenediamine/N-N-diethyl, Arsenites, Stabilized neutral orthotolidine test.

Five commercially available test kits for measuring free available chlorine (FAC) have been evaluated in the final phase of tests. The liquid form of the Stabilized Neutral Orthotolidine Test (SNORT) was compared to the dry form which had been evaluated in the first phase of the study. Two variations of the SNORT color disc (with and without a zero mg/l window) were compared. The Syringaldazine (Liquid), DPD (N,N-diethyl-p-phenylenediamine) and MOTA (Modified Orthotolidine-Arsenite) test procedures were also evaluated. (Modified author abstract)

JUL-1028-RW PC$7.75/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorwerkstoffe.
CONTRIBUTION TO INVESTIGATION OF PERTURBING INFLUENCES IN THE QUANTITATIVE SPECTRAL ANALYSIS OF AL ALLOYS.
J. Stachova. Dec 73, 93p
In German.

Descriptors: (*Aluminium alloys, *Chemical analysis), Emission spectroscopy, Quantitative chemical analysis.

For abstract, see NSA 29 12, number 31624.

PATENT-3 392 177 Not available NTIS
Department of Agriculture, Washington, D.C.
CONJUGATION OF VEGETABLE OILS VIA IRON TRICARBONYL COMPLEX AND DECOMPOSITION THEREOF BY CARBON MONOXIDE.
Patent, *Filed 13 Oct 65, patented 9 Jul 68,
Edwin N. Frankel. 9 Jul 68, 2p PAT-APPL-495 734,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vegetable oils, *Isomerization, *Complex compounds, Pressure, Carbon monoxide, Catalysts, Fatty acids, Decomposition.
Identifiers: PAT-CL-260-405-6, *Iron carbonyls, *Catalyst regeneration.

The invention involves the pressurized carbon monoxide decomposition of iron tricarbonyl complexes of polyunsaturated vegetable oils formed during the isomerization of such oils with iron pentacarbonyl catalyst at 185C. The object of the present invention is a process for substantially quantitatively decomposing iron tricarbonyl conjugated fatty complexes. Extensive polymerization and loss of the thereby released conjugated fatty portion of the complex is avoided, and the tricarbonyl moiety of the complex is concurrently regenerated to recoverable iron pentacarbonyl.

7C. Organic Chemistry

AD-779 905/9GA PC$5.25/MF$1.45
R and D Associates Santa Monica Calif
THE THERMODYNAMICS OF THE POLYSTYRENE-HYDROCARBON VAPOR SYSTEM.
F. J. Krieger. May 73, 44p Rept no. RDA-TR-206-DNA DNA-3254F
Contract DNA001-72-C-0197

Descriptors: *Polystyrene, Vapors, Thermodynamics, Equations of state, Molecular weight, Entropy, Enthalpy, Temperature, Pressure, Tables(Data), Polymers.
Identifiers: Mollier diagrams.

The purpose of this study is the thermodynamic investigation of polystyrene over a range of temperatures up to 6000K and pressures up to 1000 atmospheres. Because polystyrene is subject to thermal breakdown and styrene has a relatively low boiling point (418.29K), only the gaseous phase was considered in determining the equilibrium compositions for the above parameters. The results of the computational program are presented in both tabular and graphic form. The latter is a conventional Mollier diagram in which specific enthalpy is plotted against specific entropy, with cross plots of temperature, pressure, and molecular weight. (Author)

AD-780 171/5GA PC$3.25/MF$1.45
Esso Research and Engineering Co Linden N J Government Research Lab
VAPOR DETECTOR.
Final rept. 10 Oct 72-15 Nov 73,
G. M. Varga, Jr. 15 Feb 74, 30p Rept no. GRU.1DJAE.74 RK-CR-74-8
Contract DAAH01-73-C-0137

Descriptors: *Gas detectors, *Piezoelectric crystals, *Dimethyl hydrazine(1-1), Test methods, Plastic coatings, Water vapor, Performance(Engineering), Sensitivity.
Identifiers: Butadiene copolymers, Acrylonitrile copolymers, Styrene copolymers.

It has been shown that coated piezoelectric crystals can detect quantitatively vapors of unsymmetrical dimethyl hydrazine (UDMH) in the presence of a background level of humidity which might be encountered by a GI in the field. The UDMH levels detected ranged from 2 ppm to 115 ppm UDMH. Four crystal coatings which were found to be effective were members of the acrylonitrile-butadiene and styrene-butadiene copolymer families. Crystals coated with these polymers also monitored water vapor quantitatively. Sensor response was sufficiently rapid so that piezoelectric instrumentation could be utilized to sound an alarm for UDMH instantly and could determine the UDMH concentration quantitatively in one minute or less. It was also shown that piezoelectric instrumentation was capable of differentiating between minute differences in UDMH level such as 30 and 31 ppm UDMH. (Author)

AD-780 426/3GA PC$3.25/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
THE CHEMISTRY AND APPLICATIONS FOR THE SOLUBILIZATION OF CHROMATE SALTS IN NONPOLAR ORGANIC MEDIA. PART I.
Phase rept.,
Jack Ohr, and Kenneth G. Clark. 5 Mar 74, 41p
Rept no. NADC-74017-30

Descriptors: *Chromates, *Complex compounds, *Dissolving, Salt spray tests, Organic solvents, Corrosion inhibition, Paints.
Identifiers: Potassium chromates, *Polyethers, Alkyd resins, Enamels.

Potassium chromate has been dissolved in significant concentrations in nonpolar organic solvents with the aid of macrocyclic polyether complexing agents. When a two phase system of chromate in water and polyether in organic solvent is agitated, the fraction of salt which is complexed into the organic phase is found to be inversely dependent on the pH of the aqueous phase. Application of this chemistry towards improving organic materials shows promise. TT-E-489F alkyd enamels containing small amounts of dissolved chromate show marked superiority over unmodified enamels in protecting aluminum, steel, and magnesium surfaces from the corrosive effects of long term 5% salt spray exposure. (Modified author abstract)

AD-780 465/1GA PC$3.00/MF$1.45
Pennwalt Corp King of Prussia Pa Research and Development Dept
INORGANIC COORDINATION POLYMERS. XVI. ZINC(II) PHOSPHINATE POLYMERS CONTAINING POLYPHENYLENE AND POLY(PHENYLENE OXIDE) SIDE GROUPS.
Technical rept.,
Piero Nannelli, Hyman D. Gillman, Harold G. Monsimer, and Shyam B. Advani. Apr 74, 23p
Rept no. TR-11
Contract N00014-69-C-0122
See also AD-770 156.

Descriptors: *Phosphinates, *Zinc compounds, *Inorganic polymers, Polyphenylene oxide, Synthesis(Chemistry), Thermogravimetric analysis, Thermal stability.
Identifiers: *Phosphinic acids, Zinc phosphinate polymers, Polyphenyl compounds.

The synthesis and characterization of a series of new phosphinic acids and the zinc polymers prepared from them are reported. These compositions are characterized by the presence of short polyphenylene zinc poly(phenylene oxide) chains as side groups. Some of the zinc derivatives were found to be tractable polymers with good thermal stability. (Author)

PAT-APPL-444 920 PC$4.00/MF$1.45
Department of Health, Education, and Welfare. Bethesda, Md. Patent Branch.
PROCESS FOR THE PREPARATION OF DEHYDROBERDINIUM SALTS.
Patent Application,
K. Y. Chang. Filed 22 Feb 74, 14p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Patent applications, *Antineoplastic agents, Synthesis(Chemistry), Aromatic polycyclic hydrocarbons, Synthesis(Chemistry), Chlorides, Organic salts, Condensation reactions.
Identifiers: Berbinium/hexadehydro-methyl-tetramethoxy, *Berbinium compounds.

The patent application describes a process for the synthesis of coralyne salts and related dehydroberbinium salts. The process includes a phenylacetyl chloride and phenylethylamine condensation, followed by cyclization, aromatization and formation of a dehydroberbinium sulfoacetate, which may thereafter be converted into other dehydroberbinium salts. The coralyne salts have antineoplastic activity. Portions of this document are not fully legible.

PATENT-APPL-739 955 Not available NTIS
Department of Agriculture, Washington, D.C.
METHOD OF PRECIPITATING POLYVALENT CATIONS.
Patent, *Filed 7 May 68, patented 18 Mar 69,
William A. P. Black, Eric T. Dewar, and David Rutherford. 18 Mar 69, 3p PATENT-3 433 738
Previously filed as PAT-APPL-527 998, and 225 168.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Precipitation(Chemistry), *Polacrylates, *Cations, Viscosity, Synthesis(Chemistry), Methacrylates, Polymers.
Identifiers: PAT-CL-210-54, Poly(gluconic acid/3-O-methacryloyl-(sodium salt)-D).

The invention relates to a method for precipitating divalent metal ions using a novel polymeric polymer having exceptional commercial promise. Aqueous solutions of the sodium salt of poly(3-O-methacryloyl-D-gluconic acid) exhibit high viscosities and effectively precipitate polyvalent cations from solution. The preparation of the above polyacid via a subsequently deacetonated isopropylidene intermediate is described.

PATENT-3 280 103 Not available NTIS
Department of Agriculture, Washington, D.C.
PRODUCTION OF METHYL 6-CHLORO-6-DEOXY-ALPHA-D-GLUCOPYRANOSIDE.
Patent, *Filed 4 Sep 64, patented 18 Oct 66,
Henry B. Sinclair. 18 Oct 66, 1p PAT-APPL-394 635,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, Synthesis(Chemistry), Hexoses, Polysaccharides.
Identifiers: *Glucopyronosides, PAT-CL-260-210, Glucopyranoside/6-chloro-6-dcoxy-alpha-D.

The invention relates to greatly simplified and much more effective process for preparing the compound methyl 6-chloro-6-deoxy-alpha-D-glucopyranoside. A high extent of replacement of the 6-hydroxy groups of methyl glucocide by chlorine occurs when a dimethylformamide solution of methyl-alpha-D-glucoside is treated with sulfur monochloride (S2Cl2).

PATENT-3 314 764 Not available NTIS
Department of Agriculture, Washington, D.C.
PICRATE PROCESS FOR DETERMINING QUARTERNARY AMMONIUM CONTENT OF MICROBIAL POLYSACCHARIDES.
Patent, *Filed 9 Jul 64, patented 18 Apr 67,
James H. Sioneker. 18 Apr 67, 3p PAT-APPL-381 594,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Quaternary ammonium salts, *Polysaccharides, *Spectroscopic analysis, Hydrolysis, Picrates, Picric acid, Ultraviolet spectroscopy, Solvent extraction, Spectrophotometry.
Identifiers: PAT-CL-23-230.

The patent describes accurate spectrophotometric determination of residual quaternary ammonium (QA) residues in QA-precipitated microbial polysaccharides. The precipitated polysaccharide is hydrolyzed with 3M monosodium phosphate and the pH of the acid hydrolysate is adjusted to a pH of about 4.3 with sodium hydroxide before adding picric acid to form the chloroform extractable QA-picrate salt, the absorbency of which at 365 micrometers is then compared with that of a standard. Unlike buffered hydrolysates containing chloride ions, the above does not cause a misleading partial solubility of the QA-picrate in the aqueous phase.

PATENT-3 314 913 Not available NTIS
Department of Agriculture, Washington, D.C.
HEXOSE POLYTHIOMERCAPTAL ADHESIVES.
Patent, *Filed 18 Jan 65, patented 18 Apr 67,
Archie J. Deutschman, Jr., and James W. Berry. 18 Apr 67, 3p PAT-APPL-426 456,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polysulfide resins, *Hexoses, *Adhesives, Condensation reactions, Polymerization, Synthesis(Chemistry).
Identifiers: PAT-Cl-260-30-8.

The invention relates to novel linear polythioacetals formed by acid catalyzed condensations of difunctional mercaptans with sugars such as glucose, fructose, mannose, galactose, and xylose. One object of the invention is the controlled preparation of a novel class of relatively low molecular weight linear polythiomercaptals from inexpensive carbohydrates, freshly acidified organic solvent solutions of which uncured polythiomercaptals may be applied as self-curing adhesives for surfaces, glass, wood, or other materials. Polythiomercaptals in an acidic environment then crosslink at ambient temperatures to provide exceptionally strong unions that are waterproof and generally insoluble.

PATENT-3 322 798 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR OBTAINING PURE METHYL AZELAALDEHYDATE FROM OZONOLYSIS OF COMMERCIAL METHYL OLEATE.
Patent, *Filed 14 May 64, patented 30 May 67,
William R. Miller, and Danny Joe Moore. 30 May 67, 2p PAT-APPL-367 600,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Oleates, Purification, Synthesis(Chemistry), Solvent extraction, Impurities, Ozonolysis, Reduction(Chemistry), Sulfites, Distillation, Aliphatic acid esters.
Identifiers: Oleic acid/(methyl-ester), PAT-CL-260-410-9, *Azelaaldehydic acid/(methyl-ester).

The patent describes an improved distillation process for obtaining high yields of pure methyl azelaaledehydate from the ozonolysis products of commercial methyl oleate. Methyl azelaaldehydate, a versatile intermediate for the preparation of polyester acetals, polyamides, and other synthetic resins, is a major product from the ozonolysis and reductive decomposition of methy oleate. While commercial grade methyl oleate gives an unusually heterogenous mixture comprising fatty acid ester, aldehydes and aldehyde esters, and acetals, condensation and oxidation products, and esters like dimethyl azelate, the patented extraction/distillation process provides a 99.8% pure product.

PATENT-3 330 840 Not available NTIS
Department of Agriculture, Washington, D.C.
DERIVATIVES OF METHYL 9,9-DIMETHOXYNONANOATE.
Patent, *Filed 8 Jun 64, patented 11 Jul 67,
Everett H. Pryde, John C. Cowan, and Danny Joe Moore. 11 Jul 67, 6p PAT-APPL-373 589,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231. $0.50.

Descriptors: *Patents, *Plasticizers, *Alcoholysis, *Acetals, *Aliphatic acid esters, Synthesis(Chemistry), Polyvinyl chloride, Catalysts, Temperature.
Identifiers: PAT-CL-260-340-9, *Nonanoic acid/9-9-dimethoxy-(methyl-ester).

The patent describes the production of superior plasticizers for PVC (polyvinyl chloride) by selectively alcoholyzing either the acetal function or the ester function of methyl 9,9-dimethoxynonanoate or by trans-acetalizing the same with ethylene glycol or with 2-methoxyethanol. Critical conditions of temperature, time, and catalyst provide alcoholysis exclusively at either the acetal function or at the ester function of an ester acetal instead of the expected simultaneous alcoholysis of both the ester and the acetal functions thereof.

PATENT-3 349 106 Not available NTIS
Department of Agriculture, Washington, D.C.
SOLVENT FOR OBTAINING VERY HIGH YIELDS OF ALDEHYDIC PRODUCTS FROM SOYBEAN OIL.
Patent, *Filed 5 May 65, patented 24 Oct 67,
Danny J. Moore. 5 May 65, 2p PAT-APPL-453 526,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Ozonization, *Hydrolysis, *Organic solvents, Oleates, Aliphatic alcohols, Carboxylic acids, Yield, Synthesis(Chemistry).
Identifiers: PAT-CL-260-406, *Azelaaldhydic acid/(methyl-ester).

The invention relates to an improved process for obtaining essentially quantitative yields of aldehydic esters such as methyl azelaaldehydate by ozonolysis of unsaturated vegetable oil esters followed by catalytic hydrogenation of the ozonolysis products. Substantially theoretical yields of methyl azelaaldehydate are obtained from methyl oleate by conducting both the ozonization and the catalytic hydrogenolysis of the resulting ozonides in about two parts by weight of a reaction solvent consisting of about equal parts of a C2-C3 monocarboxylic acid and a C2-C6 aliphatic or cyclic alcohol. Washing a methylene chloride or diethyl ether solution of the reaction products, and vacuum distillation isolates the product ester.

PATENT-3 354 104 Not available NTIS
Department of Agriculture, Washington, D.C.
PIGMENT DISPERSANTS COMPRISING PHOSPHONIC ACID DIELS-ALDER ADDUCTS OF VEGETABLE OIL MATERIALS.
Patent, *Filed 16 Mar 65, patented 21 Nov 67, Raymond Noel Faulkner, and Nirmal Sen. 21 Nov 67, 3p PAT-APPL-440 334,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Phosphonic acids, *Vegetable oils, *Diels-Alder reactions, *Dispersants, Vinyl compounds, Castor oil, Safflower oil, Linoleates, Titanium dioxide, Plastic paints, Phthalocyanines.
Identifiers: PAT-CL-260-22, Flotation inhibitors.

The invention relates to novel phosphonated derivatives (Diels-Alder adducts) of vegetable oil materials having conjugated unsaturation which completely inhibit the flotation of phthalocyanine blue-tinted titanium dioxide alkyd paints. The authors have prepared phosphonic acid Diels-Alder adducts of isomerized vegetable oils such as safflower oil, dehydrated castor oil, etc., and the corresponding derivatives of conjugated fatty esters such as methyl 9.11-linoleate by a novel process which involves reacting the oil or ester with vinyl phosphonic acid in the presence of a catalytic amount of azo-bis-isobutyronitrile. If the vinyl phosphonic acid is not highly compatible with the fatty material, the reaction is greatly improved by substituting the more compatible vinyl phosphonic dichloride but the resulting dichloride ester must then be hydrolyzed.

PATENT-3 356 699 Not available NTIS
Department of Agriculture, Washington, D.C.
ALKALI ISOMERIZATION OF CREPENYNIC ACID TO 8,10,12-OCTADECATRIENOIC ACID.
Patent, *Filed 9 Jun 65, patented 5 Dec 67, Marvin O. Bagby, and Kenneth L. Mikolajczak. 5 Dec 67, 2p PAT-APPL-462 759,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Isomerization, *Fatty acids, Cyclization, Cyclohexadiene compounds, Carboxylic acids, Vegetable oils, Molecular isomerism, Seeds.
Identifiers: Octadecatrienoic acids, Octadecenynoic acids, PAT-CL-260-405-6, Crepis foetida.

The patent describes the alkali isomerization of crepenynic acid, i.e., cis-9-octadecen-12-ynoic acid, a major consituent of the seed oil of Crepis foetida. It results successfully in the formation of a conjugated ene-allenic intermediate, namely, cis-9,11, 12-octadecatrienoic acid. On heating at 100C, it forms a recoverable 2:1 mixture consisting of trans,cis,trans- and trans,cis,cis-8,10,12-octadecatrienoic acids, which mixture even in the absence of alkali cyclizes at about 180C. to provide high yields of the mixed C18 cyclohexadiene monocarboxylic acid isomers essentially free of cyclic acid polymer.

PATENT-3-373 175 Not available NTIS
Department of Agriculture, Washington, D.C.
CONJUGATION OF VEGETABLE OILS VIA IRON TRICARBONYL COMPLEX.
Patent, *Filed 9 Jul 65, patented 12 Mar 68, Edwin N. Frankel. 12 Mar 68, 2p PAT-APPL-470 938,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vegetable oils, *Drying oils, *Isomerization, Complex compounds, Chemical bands, Molecular isomerism.
Identifiers: Iron carbonyls, PAT-CL-260-405-6, *Conjugation.

The patent describes conjugation of polyunsaturated vegetable oils, or methyl esters thereof with excess iron pentacarbonyl. The reaction provides markedly improved yields of conjugated fatty iron tricarbonyl complex that is then completely decomposed with FeCl3 to provide an almost fully conjugated drying oil product. At 185 C. the formation of conjugated complex is greatly increased and the reaction need not be interrupted to vent complex inhibiting formations of CO2.

PATENT-3 373 176 Not available NTIS
Department of Agriculture, Washington, D.C.
TERTAMETHYL CYCLOBUTANEDIOL DIESTERS OF LINSEED-DERIVED C18 SATURATED VICINALLY SUBSTITUTED CYCLIC MONOCARBOXYLIC ACID ISOMER MIXTURE.
Patent, *Filed 22 Sep 65, patented 12 Mar 68, John P. Friedrich. 12 Mar 68, 3p PAT-APPL-489 435,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Aliphatic acid esters, *Lubricants.
Identifiers: PAT-CL-260-410, Linolenic acids.

The patent describes the diesters formed by reacting a de-aromatized cyclized linolenic acid isomer mixture with two equivalents of tetramethyl cyclobutanediol. They exhibit low pour points coupled with high resistance to thermal oxidation. The product meets current military specifications for aviation lubricants.

PATENT-3 377 302 Not available NTIS
Department of Agriculture, Washington, D.C.
SAPONIFIED STARCH ACRYLATE GRAFTS.
Patent, *Filed 18 Jan 66, patented 9 Apr 68, Lewis A. Gugliemelli, Mary Ollidene Weaver, and Charles R. Russell. 9 Apr 68, 2p PAT-APPL-521 441,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Starches, *Graft polymerization, Quaternary ammonium salts, Saponification, Thickeness.
Identifiers: PAT-CL-260-17-4.

The patent concerns the discovery that the non-dispersible very lowly substituted starch copolymers formed by the ceric ammonium nitrate-initiated reaction of either granular or gelatinized starch with from about 1 to 2 proportions by weight of methylacrylate are readily saponified with a theoretical amount of base in a minimum amount of water to provide carboxyl-containing starch graft copolymers. These are water dispersible and that optionally can be precipitated from the reaction solution with alcohol for packaging or can be diluted without isolation to directly provide low cost industrial thickeners.

PATENT-3 383 284 Not available NTIS
Department of Agriculture, Washington, D.C.
COSMETIC COMPOSITIONS CONTAINING CYCLIC C18 AND C20 ALCOHOLS.
Patent, *Filed 19 Jun 64, patented 14 May 68, Edward W. Bell, and John C. Cowan. 14 May 68, 5p PAT-APPL-393 798,
Previously filed at PAT-APPL-350 917, 10 Mar 64.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Cycloaliphatic alcohols, Cyclohexane compounds, Synthesis(Chemistry).
Identifiers: PAT-Cl-167-91, *Cosmetics.

The invention concerns rapidly absorbable cosmetic creams and lotions that are highly resistant to the development of rancidity and that do not require the masking of odoriferous constituents. They are provided by replacing the conventional lanolin and cetyl alcohol components with disubstituted cyclohexane type saturated C18-C20 alcohol mixed isomers from the catalytic reduction of the corresponding vegetable oil-derived saturated cyclic acids.

PATENT-3 385 719 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR PRODUCTION OF AN ALKALI STARCH XANTHATE SOLUTION.
Patent, *Filed 25 Feb 65, patented 28 May 68, Earl B. Lancaster, Howard F. Conway, Laurence A. Weinecke, and Edward L. Griffin, Jr. 28 May 68, 3p PAT-APPL-435 382,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, Dissolving, Sodium hydroxide, Carbon disulfide, Viscosity, Solutions, Dispersions.
Identifiers: *Starch xanthates, PAT-CL-106-213.

The invention relates to a one step process for preparing highly aqueous solutions or dispersions of sodium starch xanthate or of xanthated wheat flour. Very low viscosity aqueous 10 percent starch xanthate solutions are directly produced without a final addition of water by stirring starch or pregelatinized starch in the form of an aqueous dispersion containing only 10 percent of starch based on the weight of the dispersion with up to 0.5 mole equivalents of NaOH and CS2, preferably at or only slightly above room temperature in a closed mixer for up to one hour. These aqueous cereal grain xanthate compositions are pourable fluids rather than doughlike plastic masses and can readily be pumped by contentional low power pumps.

PATENT-3 433 752 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR PREPARING RIGID POLYURETHANE FOAMS OF OPEN CELL STRUCTURE.
Patent, *Filed 4 Jan 67, patented 18 Mar 69, Bonnie L. Zagoren, Felix H. Otey, and Charles L. Mehltretter. 18 Mar 69, 3p PAT-APPL-607 151,
Previously filed as PAT-APPL-492 949, 4 Oct 65.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polyurethane resins, *Cellular plastics, Sulfonates.
Identifiers: PAT-CL-260-2-5.

The patent covers a process in which it was discovered that the addition of either the preformed salt of an alpha-sulfonated higher fatty acid or, preferably, sufficient amounts of the alpha-sulfostearic or alpha-sulfopalmitic acid converts an expected predominantly closed-cell foam into a predominantly open-celled foam in which most of the cells are interconnected by fine pore-like foramina or capillaries, thus providing superior sound-absorbing properties. The foams are those formed from polyethers or polyisocyanates.

PATENT-3 513 205 Not available NTIS
Department of Agriculture, Washington, D.C.
CYCLIC C18 AND C20 ALCOHOLS.
Patent, *Filed 10 Mar 64, patented 19 May 70, Edward W. Bell, and John C. Cowan. 19 May 70, 4p PAT-APPL-350 917,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Cycloaliphatic alcohols, *Cyclohexane compounds, Vegetable oils, Synthesis(Chemistry), Reduction(Chemistry), Aliphatic acids, Catalysts, Melting points.
Identifiers: PAT-CL-260-617, Cosmetics.

The invention relates to novel very low melting, odorless C18 and C20 saturated cyclic alcohols (disubsitituted cyclohexanes). Disubstituted cyclohexane monocarboxylic acids having 18 and 20 carbon atoms are catalytically reduced to the corresponding alcohols. They have high molecular weights and low melting points, are not readily subject to oxidative deterioration, and are useful as substitutes for palmityl alcohol and lanolin is cosmetic creams.

PATENT-3 518 176 Not available NTIS
Department of Agriculture, Washington, D.C.
GRAFT POLYMERIZATION OF STARCH IN NOVEL ALCOHOL REACTION MEDIUM.
Patent, *Filed 25 Feb 66, patented 30 Jun 70,
Zoila Reyes, and Charles R. Russell. 30 Jun 70, 4p PAT-APPL-529 947,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Graft polymerization, *Starches, *Vinyl compounds, Cerium, Catalysts, Amyloses, Amylopectins, Radiation chemistry, Polysaccharides, Organic solvents, Alcohols, Dimethylformamide.
Identifiers: PAT-CL-204-159-12.

The patent concerns a process for graft polymerizing onto a starch, amylose, or amylopectin, a vinyl monomer in an aqueous medium, the improvement comprising replacing the water with an equal volume of ethylene glycol, glycerol, n-butanol, sorbitol, or dimethylformamide. The reaction is catalyzed by radiation or ceric-ion catalysts.

PATENT-3 669 915 Not available NTIS
Department of Agriculture, Washington, D.C.
FLOCCULANTS FROM STARCH GRAFT COPOLYMERS.
Patent, *Filed 8 Sep 70, patented 13 Jun 72,
Duane A. Jones, George F. Fanta, and Robert C. Burr. 13 Jun 72, 4p PAT-APPL-70-491,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50

Descriptors: *Patents, *Starches, *Graft polymerization, *Flocculants, Quaternary ammonium salts.
Identifiers: Water pollution control, PAT-CL-260-17-4-GC.

The invention describes the prepartion of starch graft copolymers by the free radical-induced reaction of starch with 2-hydroxy-3-methacryloyloxypropyltrimethylammonium chloride (graft monomer). More specifically, the invention relates to cationic graft copolymers having highly active flocculating properties.

PATENT-3 775 453 Not available NTIS
Department of the Air Force Washington D C
PREPARATION OF HEXAFLUOROISOPROPOXIDES OF ALUMINUM AND GROUP IV ELEMENTS.
Patent,
Khodabakhsh S. Mazdiyasni, Barbara J. Schaper, and Leanne M. Brown. Filed 14 Mar 72, patented 27 Nov 73, 3p Rept nos. PAT-APPL-234 674,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Metalorganic compounds, *Propanols, Germanium compounds, Synthesis(Chemistry), Fluorine compounds, Catalysts, Aluminum compounds, Silicon compounds, Titanium compounds, Hafnium compounds, Zirconium compounds, High purity, Oxides.
Identifiers: PAT-CL-260-429-R, *Alcobolates.

The invention relates to a process for preparing fluoro-substituted alkoxides of aluminum, silicon, germanium, titanium, zirconium and hafnium. Hexafluoroisopropoxides of aluminum, silicon, germanium, titanate, zirconium and hafnium are prepared by reacting the chloride of one of the foregoing elements with sodium or potassium hexafluoroisopropoxide in the presence of hexafluoro-2-propanol. The fluoro-substituted compounds obtained are useful as catalysts in polymerization reactions and in the preparation of high purity oxides by thermal or hydrolytic decomposition of the compound. The compounds can also be used in the preparation of high temperature polymers, fluids and lubricants.

PATENT-3 784 517 Not available NTIS
Department of the Air Force Washington D C
PREPARATION OF POLYBENZIMIDAZOLES IN THE PRESENCE OF A SULFONE SOLVENT.
Patent,
Frederick L. Hedberg, and Carl S. Marvel. Filed 27 Jun 72, patented 8 Jan 74, 5p Rept nos. PAT-APPL-266 814,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Condensation reactions, *Sulfones, Amines, Organic solvents, Synthesis(Chemistry), Polymerization.
Identifiers: PAT-CL-260-63-R, *Polybenzimidazoles, Aryl acid esters, Dibasic acid esters, Polyamines.

The invention relates to a process involving a one-step condensation reaction for preparing high molecular weight polybenzimidazoles. It comprises reacting an aromatic tetraamino compound with the diphenyl ester or anhydride of an aromatic dicarboxylic acid in the presence of an aliphatic or aromatic sulfone solvent or reaction medium. The process provides in quantitative yields high molecular weight products that are particularly suitable for use in fiber formation.

PATENT-3 787 459 Not available NTIS
Department of Agriculture, Washington, D.C.
SELECTIVE HYDROFORMYLATION OF UNSATURATED FATTY COMPOUNDS.
Patent, *Filed 23 Oct 70, patented 22 Jan 74,
Edwin N. Frankel. 22 Jan 74, 9p PAT-APPL-83 618,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vegetable oils, *Oxidation, Alcohols, Carboxylic acids.
Identifiers: PAT-CL-260-410-7.

A process is described in the patent for converting unsaturated vegetable oil material without isomerization into high yields of formyl products which can be subsequently reduced to the corresponding hydroxymethyl products or oxidized to the corresponding carboxy products. The conversion is accomplished by reacting vegetable oil material with hydrogen and carbon monoxide in the presence of a highly selective catalyst system.

PATENT-3 795 670 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR MAKING STARCH TRIACETATES.
Patent, *Filed 5 Mar 73, patented 5 Mar 74,
Arthur M. Mark, and Charles L. Mehltretter. 5 Mar 74, 4p PAT-APPL-337 790,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Esterification, *Starches, Fibers, Polymeric films, Amyloses.
Identifiers: PAT-CL-260-233-5.

An improved process for the esterification of starches such as high-amylose starches and amylose under conditions of minimum depolymerization of the polysaccharide to obtain high molecular weight starch triacetates soluble in organic solvents for fiber and film manufacture is described in the patent.

PATENT-3 795 671 Not available NTIS
Department of Agriculture, Washington, D.C.
EPOXYPROPYL STARCH.
Patent, *Filed 21 Dec 71, patented 5 Mar 74,
Robert E. Wing, and William M. Doane. 5 Mar 74, 5p PAT-APPL-210 549,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Starches, *Papermaking, Additives.
Identifiers: PAT-CL-260-233-3-R.

The patent covers a process for preparing novel epoxypropyl starch compounds from starches and starch derivatives. At epoxypropyl D.S. levels of up to 0.09 the compounds are water-soluble and increase both wet and dry strength of paper at a 1% level of addition.

TT-71-51003 PC$3.00/MF$1.45
Forest Service, Washington, D.C.
LEVOGLUCOSAN POLYETHERS, I. POLYMERIZATION OF LEVOGLUCOSAN AND ITS ETHERS (POLIEFIRY LEVOGLYUKOZANA. I. POLIMERIZATSIYA LEVOGLYUKOZANA I EGO EFIROV),
V. V. Korshak. 1973, 18p
Trans. of Vysokomolekulyarnye Soedineniya (USSR) v3 n3 p477-485 1961. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Polymerization, Oxygen heterocyclic compounds, Reaction kinetics, Infrared spectra, Catalysts, USSR, Translations.
Identifiers: Chemical reaction mechanisms, *Levoglucosans.

The polymerization of levoglucosan (beta-1,6-anhydroglucopyranose) in absolute dioxane in the presence of different catalysts was discussed. Boron fluoride etherate, ferric chloride and aluminum chloride were found to be the effective catalysts for the polymerization. The optimum conditions for the polymerization in the presence of boron fluoride etherate were determined and the properties of polymers were studied. Polymerization of trimethyllevoglucosan to obtain high molecular weight polymers were discussed and the properties of polymers were studied. The mechanism of cationic polymerization of trimethyllevoglucosan was proposed and the mechanism of polymerization of levoglucosan was discussed.

TT-72-51118 PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.
STUDY OF VINYLARYL ETHERS. REACTIONS OF VINYLPHENYL ETHER WITH DIBUTYL ACETAL (ISSLEDOVANIE V OBLASTI VINILARILOVYKH EFIROV. REAKTSIYA VINILFENILOVOGO EFIRA S DIBUTILOVYM ATSETALEM),
M. F. Shostakovskii, and A. V. Bogdanova. 1973, 9p
Trans. of Akademiya Nauk SSSR. Doklady, v100 n1 p89-92 1955. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Aryl ethers, *Acetals, *Vinyl ethers, Hydrolysis, Chemical reactions, USSR, Translations.
Identifiers: Acetaldehyde/dibutyl-acetal, Ether/phenyl-vinyl.

It was found that vinylphenyl ether was capable of reacting with dialkyl acetals forming alkoxyphenoxyalkanes with a varying length of carbon chain. The study of the products of hydrolysis of phenoxydibutoxybutane, as also the isolation, dur-

ing the process of the main synthesis, of 1, 1,3-tributoxybutane and butylphenyl acetal enables one to assume that in addition to the main course of the reaction, there may also take place another reaction, which is accompanied by the breaking away of the alkoxygroup of acetal.

TT-73-54055 PC$3.00
Department of Agriculture, Washington, D.C.
THE METHYLOL DERIVATIVES OF METHACRYLAMIDE--NEW TEXTILE FINISHES (METYLOLOWE POCHODNE METAKRYLAMIDU-NOWE SRODKI POMOCNICZE DLA WLOKIENNICTWA),
W. Buszynska, and A. Mikolajewicz. 1974, 9p
Trans. of Polimery (Poland) v15 n10 p533-534 1970, by A. Skup. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Carbinols, Synthesis(Chemistry), Amides, Poland, Translations.
Identifiers: *Methacrylamide/N-hydroxymethyl.

The present studies were concerned with the synthesis of N-methylolmethacrylamide in aqueous solution. N-methylolmethacrylamide was obtained by condensation of methacrylamide with aqueous formaldehyde in an alkaline solution in the presence of a catalyst.

7D. Physical Chemistry

AD-779 869/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
TRANSPORT COEFFICIENTS OF AIR AT TEMPERATURES OF FROM 3,000 TO 25,000 K AND AT PRESSURES OF 0.1, 1, 10, AND 100 ATM,
I. A. Sokolova. 30 Apr 74, 23p Rept no. FTD-HT-23-907-74
Edited trans. of Zhurnal Prikladnoi Mekhaniki i Tekhnicheskoi Fiziki (USSR) n2 p80-90 1973, by Paul J. Reiff.

Descriptors: *Air, Transport properties, High temperature, Pressure, Thermodynamics, Translations, USSR.

AD-779 824/2GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
DEFECT EQUILIBRIA FOR EXTENDED POINT DEFECTS, WITH APPLICATION TO NON-STOICHIOMETRIC CERIA.
Journal article,
P. L. Land. 13 Feb 73, 9p Rept no. ARL-74-0037
Revision of report dated 5 Jan 73.
Availability: Pub. in Jnl. of Physics and Chemistry of Solids, v34 p1839-1845 1973.

Descriptors: *Cerium compounds, *Defects(Materials), Electrical conductivity, Stoichiometry, Crystal structure.
Identifiers: Polarons, *Cerium oxides.

The dependence of electronic conductivity and composition of ceria on oxygen pressure is described by equilibrium equations for a material containing oxygen vacancies, divacancies, cerium interstitials and polarons, where these defects are considered to include distorted zones of material. The analyses takes the extension of simple 'point defects' into proper account, whereas earlier analyses have not. It is concluded that available data can be explained by polarons in equilibrium with isolated oxygen vacancies, but not with divacancies or interstitial cerium ions. (Author)

AD-779 825/9GA Reprint
Frankford Arsenal Philadelphia Pa
THE CHARGE DISTRIBUTION IN CHROMIUM (III) AND IRON (III) HEXAFLUORIDE,
L. E. Harris, and E. A. Boudreaux. 12 Jul 73, 6p Rept no. FA-A74-4
Prepared in cooperation with Louisiana State Univ., New Orleans. Dept. of Chemistry.
Availability: Pub. in Chemical Physics Letters, v23 n3 p434-436, 1 Dec 73.

Descriptors: *Metal complexes, Fluorides, Iron compounds, Chromium compounds, Molecular orbitals.
Identifiers: *Chromium fluorides, *Iron fluorides, Self consistent field method, *Electron distribution.

Semi-empirical molecular orbital calculations were performed for CrF6(3-) and FeF6(3-). The method calculation is derived from the HF SCF equations using approximations appropriate to the highly ionic transition metals halides. The results of these calculations are shown to be in better agreement than previous semi-empirical calculations with X-ray emission line shifts and atom charges and populations estimated from these shifts. (Author)

AD-779 872/1GA PC$4.00/MF$1.45
Princeton Univ N J
ZERO-FIELD PARAMAGNETIC RESONANCE OF TRIVALENT GADOLINIUM IN SEVERAL LANTHANON TRIS(ETHYLSULFATE) NONAHYDRATES AND NONADEUTERATES--DETERMINATION OF CRYSTAL FIELD AND HYPERFINE STRUCTURE PARAMETERS.
Technical rept. 1 Jun-30 Nov 74,
E. R. Bernstein, and G. M. Dobbs. 1 Jun 74, 82p Rept no. TR-6
Contract N00014-67-A-0151-0032

Descriptors: *Electron paramagnetic resonance, *Gadolinium, Atomic energy levels, Hyperfine structure, Crystals, Magnetic dipoles, Lanthanum compounds, Quadrupole moment, Deuterium compounds.
Identifiers: *Zero field paramagnetic resonance, Crystal fields, Line width.

Employing isotopically pure trivalent 155Gd, 157Gd, and 160Gd as guests in dilute mixed crystals of lanthanum tris(ethylsulfate) nonahydrate (La3(C2H5SO4)3.9H2O), it has been possible to determine both accurate zero-field splitting parameters of crystal field origin and hyperfine structure constants due to magnetic dipole and electric quadrupole interaction terms. The zero-field paramagnetic resonance spectroscopic method is used. It is reasoned that the quadrupole hyperfine constant is due, almost entirely, to lattice contributions; moreover, it is shown to be of the expected order of magnitude and sign. The hyperfine anomaly is discussed. A set of crystal field parameters are reported for the first time for 160Gd in crystals of La(C2H5SC4)3.9D2O which differ significantly from those of the hydrate. Variations of crystal field parameters with various lanthanon host ions are also observed. Finally, a few comments concerning zero-field line widths and their measurement are made. (Modified author abstract)

AD-779 890/3GA PC$4.00/MF$1.45
Systems Science and Software La Jolla Calif
A STUDY OF EQUATIONS OF STATE/OPACITY OF IONIZED GASES.
Final rept. 31 Oct 72-31 Oct 73,
James M. Harvey, Ira Katz, and Robert C. Vik. Oct 73, 84p Rept no. SSS-R-73-1946 DNA-3278F
Contract DNA001-73-C-0061

Descriptors: *Opacity, *Plasmas(Physics), *Equations of state, Positrons, Electronic states, Emission spectra, Absorption spectra, Computerized simulation, Electron transitions, Atomic energy levels, Transmittance, Rates, Computer programming, Photons, Particle collisions, Temperature.
Identifiers: Electron distribution.

The report describes additions and modifications to the CAPO system of opacity codes and presents the results of other research tasks on emission, absorption and transport of radiation in high temperature materials. The accuracy of several approximate methods of opacity treatment is assessed. The radiative properties of thin plasmas, not in local thermodynamic equilibrium (non-LTE) are considered. Several codes written to provide ionic charge distributions, excited state populations, and emission rates in non-LTE plasmas are described. Electron positron pair production rates are studied and estimates made of the times required to establish significant pair populations under various conditions. (Author)

AD-779 899/4GA PC$3.25/MF$1.45
Case Western Reserve Univ Cleveland Ohio Electrochemistry Research Lab
RUTHENIUM OXIDE CATALYSTS FOR THE OXYGEN ELECTRODE.
Technical rept.,
W. O'Grady, C. Iwakura, J. Huang, and Ernest Yeager. 1 May 74, 27p Rept no. TR-37
Contract N00014-67-A-0404-0006

Descriptors: *Electrochemistry, *Oxygen electrodes, *Catalysts, Oxides, Ruthenium compounds, Titanium, Reaction kinetics.
Identifiers: Linear sweep voltammetry, *Ruthenium oxides, Chemical reaction mechanisms, Tafel lines.

The electrochemical properties of ruthenium oxide on Ti and other substrates have been examined using linear sweep voltammetry. The oxygen electrode kinetics have been studied in alkaline solutions on RuOx on Ti using principally the rotating disk technique. O2 reduction involves the formation of peroxide in the solution phase. O2 generation occurs at low overpotentials and the kinetics are characterized by a Tafel slope of 0.040V/decade and a first order dependence on OH concentration. Mechanisms are proposed to explain the experimental results. (Author)

AD-779 904/2GA PC$4.50/MF$1.45
Calspan Corp Buffalo N Y
EFFLUENT SEPARATION BY SURFACE-ACTIVE AGENTS.
Final rept. Jan 72-Dec 73,
Robert E. Baier, and Vito A. DePalma. 3 Nov 73, 110p
Contract F33657-72-C-0539, ARPA Order-1702

Descriptors: *Surface active substances, *Surface chemistry, Separation, Beads, Carbon, Ultrasonic radiation, Dispersing, Particulates, Particles, Kaolinite, Chemical analysis.
Identifiers: *Deagglomeration, *Agglomerates, Water analysis.

The purpose of this program was to apply basic surface chemical theory to developing simple means for nondestructively separating the submicrometer constituents of complex multicomponent agglomerates obtained as samples for environmental quality assessment. The techniques evaluated in this program do not significantly modify the constituents while arraying them on substrates suitable for microscopic, spectroscopic, or x-ray analysis. Typical experiments involved mixing the agglomerates to be separated with various solid spreading aids, liquid spreading aids, adhesive and autophobic agents. Agglomerates treated with such materials were then exposed to interfacial stresses expected to supply the energy necessary to array these mixtures into monolayer surface films. The best technique found involves as a first step ultrasonic dispersion of particulate material in the presence of one of the spreading aids. The colloidal dispersion introduced to a gas/liquid interface in order to transform the particles in the volume phase into a permanent two-dimensional array. Polymeric spreading aids serve the purpose of distributing the particles over the surface and fixing them in an immobile binder layer. Brief recommendations for future work are outlined. (Modified author abstract)

AD-779 925/7GA PC$3.25/MF$1.45
Aerospace Corp El Segundo Calif Lab Operations

KINETICS OF THE REACTION BETWEEN FE(II) AND AG(I) CATALYZED BY SILVER NUCLEI ON TIO2 SURFACES.
Interim rept.,
Paul D. Fleischauer, and John R. Shepherd. 25 Apr 74, 42p Rept no. TR-0074(9270-02)-2 SAMSO-TR-74-116
Contract F04701-73-C-0074

Descriptors: *Charge transfer, *Silver, *Iron, *Surface reactions, Ions, Oxidation reduction reactions, Thin films, Catalysis, Adsorption, Reaction kinetics, Single crystals, Surfaces.
Identifiers: Chemical reaction mechanisms, Titanium dioxide, Langmuir isotherms.

The one-electron reduction of Ag(I) by Fe(II) in aqueous solution is catalyzed by nuclei of silver metal on TiO2 single-crystal and thin-film surfaces. The reaction results in the selective precipitation of silver on the catalytic nuclei, forming spherically shaped silver particles that eventually grow together into a continuous film. The kinetics of the reaction show that adsorption of Ag(I) on the substrate TiO2 surface is an important step in the mechanism, the adsorption follows a Langmuir isotherm, and the rate-determining step of the reaction is the electron transfer from Fe(II) to adsorbed Ag(I). Results are presented for two types of catalytic nuclei on TiO2: that introduced by photochemical deposition of silver, and that formed by vapor deposition. Significant differences were observed in the kinetics of the reaction on the two types of silver surface. These differences indicate the need for caution in extending kinetics results for 'model' systems to practical applications. (Author)

AD-779 949/7GA PC$5.75/MF$1.45
Massachusetts Inst of Tech Cambridge Aerophysics Lab
HIGH TEMPERATURE OXIDATION OF GRAPHITE BY A DISSOCIATED OXYGEN BEAM.
Technical rept.,
George Nung-Keung Liu. Aug 73, 221p Rept no. TR-186 AFOSR-TR-74-0872
Contract F44620-71-C-0009

Descriptors: *Graphite, *Oxidation, Reaction kinetics, Mass spectrometry, Molecular beams, Heat shields, Theses.
Identifiers: Oxygen atoms.

Graphite oxidation by dissociated oxygen has been studied by molecular beam-mass spectrometry techniques. A high temperature atomic oxygen beam source (capable of generating an atom-to-molecule flux ratio of 0.5) and a modulated, pulse-counting detection scheme have been developed for the study. The target (isotropic graphite) temperature was varied from 1000 to 1700K with a beam temperature range of 300 to 2200K and an equivalent beam pressure of about 10 to the minus eighth 10 to minus ninth power atm. Measurements were carried out in the principal plane, and both beam incident and detector angles, measured from the target normal, were varied independently. (Modified author abstract)

AD-779 990/1GA PC$3.00/MF$1.45
Edgewood Arsenal Aberdeen Proving Ground Md
STUDIES ON THE REGENERATION OF ACTIVATED CARBON FOR REMOVAL OF ALPHA-TNT FROM WASTE WATERS.
Technical rept. Sep 72-Dec 73,
Mary M. Demek, George T. Davis, James A. Richmond, Harold Z. Sommer, and David H. Rosenblatt. May 74, 23p Rept no. EC-TR-74008

Descriptors: *Activated carbon, *TNT, *Regeneration(Engineering), Adsorption, Extraction, Chemical analysis.

Repetitive solvent regeneration of Filtrasorb 400 for absorption of alpha-TNT from aqueous solutions has been studied using column breakthrough analysis. There is a 24% drop in efficiency of carbon adsorption with the first regeneration followed by successively slower losses in efficiency with further regenerations. Significant regeneration is achieved, and arguments are developed for application of the data to long-column design. This development is significant, for it allows application of data from convenient short-column systems (10 to 15 cm) to be applied to long-column (400 cm, etc., >25 critical bed depths) systems which cannot be practically studied in the laboratory. Adsorption capacity of thermally regenerated (incineration) carbon was very low. Preliminary studies suggest that hot acetone extraction may improve regeneration efficiencies over the ambient elution methods used in the column work. (Author)

AD-780 040/2GA PC$5.50/MF$1.45
Illinois Univ Urbana Coordinated Science Lab
STRUCTURE-SENSITIVE CHEMISORPTION: HYDROGEN AND NITROGEN ON SINGLE CRYSTAL PLANES OF TUNGSTEN AND RHODIUM.
Doctoral thesis,
Richard Samuel Polizzotti. Apr 74, 183p Rept nos. R-646, UILU-ENG-74-2210
Contract DAAB07-72-C-0259, Grant AF-AFOSR-2210-72

Descriptors: *Chemisorption, *Hydrogen, *Nitrogen, Tungsten, *Rhodium, Single crystals, Adsorption, Reaction kinetics, Dissociation, Diatomic molecules, Temperature, Surface properties, Crystal structure, Surface chemistry, Work functions, Field emission, Theses, Computer programs, FORTRAN.
Identifiers: Gas surface interactions, Chemical reaction mechanisms, Field emission microscopy.

The limiting mechanism in the dissociative adsorption of hydrogen and nitrogen on the closest packed planes of tungsten and rhodium has been investigated. In particular, the author has sought to determine how the rate of interaction varies with exposure and substrate temperature in order to establish under what conditions the interaction of these gases with the metal surface can be entirely prevented. In those cases where adsorption can be inhibited, the possible mechanisms responsible for limiting the rate of interaction have been explored. The available experimental data is reviewed. The experimental conditions dictating a choice of experimental technique employed in these measurements and the details of the experimental procedures are discussed.

AD-780 074/1GA Reprint
Queen'S Univ Belfast (Northern Ireland) Dept of Applied Mathematics and Theoretical Physics
SPIN-POLARIZATION IN THE ELASTIC SCATTERING OF ELECTRONS BY ONE-ELECTRON ATOMS,
P. G. Burke, and J. F. B. Mitchell. 17 Aug 73, 17p
Contract N00014-69-C-0035
Availability: Pub. in Jnl. of Physics B, Atomic and Molecular Physics, v7 n2 p214-228 1974.

Descriptors: *Electron scattering, *Polarization, Atoms, Elastic scattering, Great Britain.
Identifiers: *Atom electron interactions.

An analysis of spin-polarization in low energy elastic scattering of electrons by one electron state atoms is carried out allowing both for electron exchange and relativistic effects. First the collision matrix is written in terms of the asymptotic form of the solutions of the radial equations. Then arguments, based on the invariance of the hamiltonian under time reversal, space rotation and space reflection are used to write down the most general form of this matrix. It is found that it can be expressed in terms of six independent amplitudes. Then expressions for the observable quantities, including the spin polarization of the electron and of the atom after the collision are derived. Finally, the analysis is specialized to the case where spin-polarization effects are caused by a spin-orbit interaction and these effects are considered in the neighbourhood of cusps and resonances in electron alkali atom scattering. (Author)

AD-780 075/8GA Reprint
Queen'S Univ Belfast (Northern Ireland) Dept of Applied Mathematics and Theoretical Physics
THE R-MATRIX METHOD IN ATOMIC PHYSICS,
P. G. Burke. 1974, 17p
Contract N00014-69-C-0035
Presented at the Conference on Numerical Methods in Atom-Electron Collisions Held in Paris (France) on 9-12 Jul 73.
Availability: Pub. in Computer Physics Communications, v6 p288-302 1974.

Descriptors: *Matrices(Mathematics), Great Britain, Cross sections, Computer programming, Photoionization, Electron scattering, FORTRAN.
Identifiers: Polarizability, Atom electron interactions, *R matrix.

The R-matrix method and related theories are first briefly reviewed. Then the application of the method in the calculation of atomic polarizabilities, photoionization cross sections, multiphoton processes and electron-atom scattering is discussed. Finally, computer program packages which implement these calculations are described. (Author)

AD-780 076/6GA Reprint
Queen'S Univ Belfast (Northern Ireland) Dept of Applied Mathematics and Theoretical Physics
RELATIVISTIC Z-EXPANSIONS FOR EXCITED STATES OF HE AND LI,
R. Snyder. 5 Feb 73, 9p
Contract N00014-69-C-0035
Sponsored in part by National Science Foundation, Washington, D.C., and Advanced Research Projects Agency, Arlington, Va.
Availability: Pub. in Jnl. of Physics, B: Atomic and Molecular Physics, v7 n3 p335-341 1974.

Descriptors: *Helium, *Lithium, Electronic states, Excitation, Atomic energy levels, Relativity theory, Great Britain.
Identifiers: Z expansions.

Calculations of first-order relativistic Z-expansion coefficients are extended to states in the He and Li isoelectronic sequences containing 3p and 4p electrons. It is noted that the Briet interaction contributes only through exchange terms when dealing with the jj-configuration average of two non-equivalent electrons. Second-order coefficients for excited two-electron states are extrapolated from the variational calculations of Accad et al. (1971). Z-expansion predictions of the (1s)2(np)3P doublet splittings (n = 2,3,4) are compared to experimental and to other theoretical results. (Author)

AD-780 077/4GA Reprint
Emory Univ Atlanta Ga Dept of Chemistry
THE RATE OF HOMOGENEOUS RECOMBINATION OF FLUORINE ATOMS.
Interim rept. no. 7,
P. S. Ganguli, and M. Kaufman. 21 Dec 73, 7p
Contract N00014-73-C-0219
Availability: Pub. in Chemical Physics Letters, v25 n2 p221-224, 15 Mar 74.

Descriptors: *Fluorine, *Recombination reactions, Chemiluminescence, Atoms, Reaction kinetics.

The recombination rate of fluorine atoms has been determined in a Teflon-coated flow reactor at 295K and pressures of 10--81 torr with Ar as the carrier gas. Concentrations of atomic fluorine are measured by titrating with Cl2 and using the intensity of chlorine atom recombination emission as an endpoint indicator. The data is fit with a third-order homogeneous recombination rate constant. The measured rate constant is ca. a factor of 10 less than values calculated by two different theo-

ries and ca. a factor of 100 less than the accepted rate constants for homogeneous recombination of most other atoms under similar conditions. (Modified author abstract)

AD-780 111/1GA PC$3.25/MF$1.45
Philco-Ford Corp Newport Beach Calif Aeronutronic Div
THERMODYNAMIC PROPERTIES OF HIGH TEMPERATURE MATERIALS.
Final rept.,
Norman D. Potter, and Gerry Piper. 31 Mar 74, 32p Rept no. U-6068 AFOSR-TR-74-0799
Contract F44620-72-C-0082

Descriptors: *Vaporization, *Silicon nitrides, Chemical equilibrium, Heat of formation, Gases.
Identifiers: *Vanadium fluorides.

A careful equilibrium study of the Si-N vapor system of mass spectrometry has shown that the only important binary Si-N vapor species is the previously known Si2N. Its heat of formation is 83 plus or minus 4 Kcal/mole. No ternary Si-N-O nor Si-C-N species were found. The accepted heats of formation of Si2C(g) and SiC2(g) were confirmed as was the heat of formation of Si3(g). The vaporization behavior of Si3N4(c) was studied and found to be quite complex. From a study of the vaporization of VF3 it was found that the primary vapor species at VF3(g) with minor, and approximately equal partial pressures of VF2(g) and VF4(g). Due to sample impurity little could be inferred from the vaporization of VF4. From these experiments and estimates of the auxiliary heats and thermal function, heats of formation were estimated. (Modified author abstract)

AD-780 157/4GA Reprint
Virginia Univ Charlottesville
BREAKDOWN OF THE DIPOLE-BORN APPROXIMATION FOR PREDICTING ANGULAR DISTRIBUTIONS OF DISSOCIATION FRAGMENTS,
Richard J. Van Brunt. 10 Sep 73, 8p
Contract DAHC04-72-C-0047
Sponsored in part by National Science Foundation, Washington, D.C. and Advanced Research Projects Agency, Arlington, Va.
Availability: Pub. in The Jnl. of Chemical Physics, v60 n8 p3064-3070, 15 Apr 74.

Descriptors: *Dissociation, *Diatomic molecules, Ionization, Molecular rotation, Electron irradiation, Angles, Oxygen, Dipoles.
Identifiers: *Angular distribution.

A general expression is given for the form of the angular distribution of molecular fragments produced by electron-induced dissociation of diatomic molecules. A model for parametizing angular distributions is introduced which allows investigation of higher-order multipole corrections to the simple dipole-Born approximation. It is found that higher-order terms are significant and even dominate the form of the angular distribution at electron energies near thresholds involving large momentum transfer. The model is useful in explaining previously observed deviations from the dipolar form and is applied to recent measurements of the angular distribution of O(-) produced from O2 by dissociative ion pair formation. When the effect of molecular rotation is included, the degree of anistropy is found to diminish with increasing lifetime of the dissociating state, although general features of the distribution are preserved. (Author)

AD-780 158/2GA Reprint
Stanford Univ Calif Dept of Mechanical Engineering
MEASUREMENT OF 9.6-MICRON CARBON DIOXIDE LASER TRANSITION PROBABILITY AND OPTICAL BROADENING CROSS SECTION.
Interim rept.,
Edward R. Murray, Charles Kruger, and Morton Mitchner. 1 Oct 73, 4p AFOSR-TR-74-0819
Contract F44620-73-C-0045
Availability: Pub. in Applied Physics Letters, v24 n4 p180-181, 15 Feb 74.

Descriptors: *Carbon dioxide lasers, Absorption, Gain, Cross sections.
Identifiers: *Transition probabilities, Collision broadening, Doppler broadening, *Line broadening.

Measurements of the 9.6- and 10.6-micrometer CO2 laser transition probabilities and optical cross sections have been made by using a tuneable CO2 leaser and room-temperature absorption cell. In order to increase the accuracy of the resulting constants, two measurements, one in the combined Doppler-and pressure-broadened regime and one in the pure pressure-broadened regime, provided data for the simultaneous solution of the transition rate and cross section. The 10.6 micrometer-9.6-micrometer values permits performance predictions and quantitative use of gain data in this laser band. (Author)

AD-780 165/7GA Reprint
Belfer Graduate School of Science New York
RESULTS OF PERCUS-YEVICK APPROXIMATION FOR A BINARY MIXTURE OF HARD SPHERES WITH NONADDITIVE DIAMETERS: R(SUBSCRIPT 11) = R(SUBSCRIPT 22) =0, R(SUBSCRIPT 12) IS GREATER THAN 0.
Interim rept.,
Saeyoung Ahn, and Joel L. Lebowitz. 29 Aug 73, 13p AFOSR-TR-74-0642
Grant AF-AFOSR-2430-73
Availability: Pub. in The Jnl. of Chemical Physics, v60 n2 p523-533, 15 Jan 74.

Descriptors: *Phase transformations, Mixtures, Phase studies, Liquid phases, Integral equations, Vapor phases.
Identifiers: *Percus-Yevick equation.

The authors investigate the properties of binary mixtures of hard sphere fluids with nonadditive diameters; and find the exact solution of the Percus-Yevick integral equation for this system in both one and three dimensions (Widom-Rowlinson model). The solution of the PY equation for the Widom-Rowlinson model exhibits a phase transition (corresponding to a separation of the components) in three but not in one dimension. This is in agreement with the true behavior of this system. The critical indices in three dimensions are classical. (Modified author abstract)

AD-780 167/3GA PC$3.25/MF$1.45
Sussex Univ Brighton (England)
EXPERIMENTS ON THE FORMATION AND SURFACE STATES OF ADSORBED HELIUM FILMS.
Final technical rept.,
D. F. Brewer. Jan 74, 47p
Contract DAJA37-73-C-2416

Descriptors: *Adsorption, Helium, Films, Porous materials, Phase studies, Nuclear magnetic resonance, Superfluidity, Density, Refrigeration systems, Great Britain, Surfaces, Cryogenics.
Identifiers: *Helium 3, *Helium 4, Gas surface interactions, Nuclear magnetic resonance(Helium 3).

The aim of this work has been an investigation of phases of He3 and He4 adsorbed on a porous substrate at low temperatures, yielding information on gas surface interactions the formation and structure of films, the effect of size limitation on the properties of three-dimensional material, free surface states on the film, and mean free path effects. The report describes the background to the work, including the recent discovery of superfluidity in liquid He3 which is closely allied to superconductivity in metals. Results of nuclear magnetic resonance measurements on monolayer and submonolayer He3 are described and discussed in terms of the mode of formation of the films. A description is given of the design and construction of a novel type of compressional refrigeration apparatus, and of apparatus to measure the density of adsorbed helium at the lambda transition in He4 and at the critical points of He3 and He4. (Author)

AD-780 178/0GA PC$3.75/MF$1.45
TRW Systems Group Redondo Beach Calif
H2-CL2 CHEMICAL LASER PROGRAM. PART I. CHEMLUM CODE FOR SPECTROSCOPIC DATA ANALYSIS.
Final rept. Dec 72-Dec 73,
J. T. Latimore, A. M. Takemoto, R. A. Ackerman, W. L. Shackleford, and G. Emanuel. Jan 74, 51p*
RK-CR-74-9-Pt-1
Contract DAAH01-73-C-0446
See also Part 2, AD-780 176.

Descriptors: *Spectrum analysis, *Chemiluminescence, *Emission spectra, *Computer programs, Hydrogen chloride, Hydrogen fluoride, FORTRAN, Temperature, Molecular rotation, Molecular vibration, Gain, Deuterium compounds, Chemical lasers, Transitions, Data reduction, Data processing.
Identifiers: Deuterium fluoride, CHEMLUM computer code, CDC 6500 computers.

A new computer code is described that analyzes data obtained from spectroscopic measurements of chemiluminescent emission. Primary input to the code is digitized spectrometer signal data of the vibrational-rotational emission spectra of HCl, HF or DF molecules. The code computes the rotational temperature, vibrational number densities, and line-by-line gains of the excited species. This report presents the theoretical basis and numerical formulation for the code, and operational procedures for its use. A sample case is included. (Author)

AD-780 179/8GA Reprint
Queen'S Univ Belfast (Northern Ireland) Dept of Applied Mathematics and Theoretical Physics
CLASSICAL STATISTICAL EQUILIBRIUM CONSTANTS AND DISTRIBUTION FUNCTIONS,
D. R. Bates, and C. S. McKibbin. 24 Aug 73, 6p
Contract N00014-69-C-0035
Availability: Pub. in Jnl. of Physics, B: Atomic and Molecular Physics, v6 p2485-2488 1973.

Descriptors: *Statistical mechanics, *Distribution functions, *Particle collisions, Interactions, Momentum, Great Britain.

Consideration is given to a binary system in which the constituents are bound together by some general interaction (dependent only on their spearation). Expressions are derived for the classical statistical equilibrium constants and for the normalized spatial and momental distribution functions both for the case of a given value of the internal energy and for the case of given values of the internal energy and of the square of the orbital angular momentum. (Author)

AD-780 181/4GA Reprint
Columbia Radiation Lab New York
SUPERRADIANT STABILITY IN SPECIALLY SHAPED SMALL SAMPLES,
R. Friedberg, and S. R. Hartmann. 21 Jan 74, 4p
Contract DAAB07-69-C-0383
Sponsored in part by Atomic Energy Commission, Washington, D.C.
Availability: Pub. in Optics Communications, v10 n4 p298-301 Apr 74.

Descriptors: *Radiance, Stability, Spheres.
Identifiers: *Superradiance.

The instability of the superradiant state due to self-induced frequency shifts is analysed for samples much smaller than lambda. The superradiant state is relatively stable in a spherical sample, but even there it will be destroyed (dephased) before it can radiate through the equator of the Bloch sphere. (Author)

AD-780 301/8GA PC$5.00/MF$1.45
Geological Survey Reston Va
PHAS20, A PROGRAM FOR SIMULTANEOUS MULTIPLE REGRESSION OF A MATHEMATICAL MODEL TO THERMOCHEMICAL DATA.
Technical rept.,
John L. Haas, Jr. Jun 74, 162p* Rept no. USGS-GD-74-018
Contract DI-14-30-3040, ARPA Order-1813

Descriptors: *Thermochemistry, *Computer programs, Heat of formation, Chemical equilibrium, Specific heat, Electrochemistry, Enthalpy, Entropy, Free energy, Phase transformations, Regression analysis, Mathematical models, Computerized simulation, Experimental data, Thermodynamics, FORTRAN.
Identifiers: PHAS20 computer program, Electric potential, Thermodynamic equilibrium.

PHAS20 performs simultaneous multiple regression of a mathematical model for the functional relations among thermodynamic quantities to experimental data for a group of chemically related species. The thermodynamic quantities included are heat capacity, entropy, enthalpy, free energy, equilibrium constant, electrochemical potential, and relative heat content. PHAS20 will fit the model to 70 sets of data containing a total of 1200 observations on 20 species. The program is divided into 4 major parts: (1) data input and editing, (2) multiple regression, (3) output of error plots and associated tubular data, and (4) output of tables of preliminary thermodynamic values. Listings are included.

AD-780 306/7GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
ANALYTICAL STRUCTURE OF A GENERALIZED DIRECT-INTERACTION APPROXIMATION,
Jon Lee. 4 Oct 71, 25p Rept no. ARL-74-0090
Availability: Pub. in Quarterly of Applied Mathematics, v31 n2 p155-176 Jul 73.

Descriptors: *Irreversible processes, *Reaction kinetics, *Approximation, Stochastic processes, Statistical analysis.

As a mathematically tractable example, the author has investigated the stochastic dynamic problem of an irreversible second-order chemical reaction. A generalized direct-interaction approximation has been devised to close off the hierarchy of moment equations at the arbitrary moment level, and then the results of such a closure technique have been compared term-by-term with the exact moment solutions. This shows qualitatively how the expansion terms summed up in the direct-interaction approximation are different from the classes of expansion terms present in the exact moment solutions. A quantitative comparison of the covariances indicates that the direct-interaction equations which are closed at the triple moment level represent a meaningful statistical approximation of the lowest order for the second-order reactive problem at hand. (Author)

AD-780 321/6GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
ELECTRON MOMENTUM DISTRIBUTION IN DIAMOND,
G. G. Wepfer, R. N. Euwema, G. T. Surratt, and D. L. Wilhite. 1973, 8p Rept no. ARL-74-0085
Availability: Pub. in International Jnl. of Quantum Chemistry Symposium n7 p613-618 1973.

Descriptors: *Compton scattering, *Diamonds, Electron energy, Distribution, Computations, Crystals, Momentum.
Identifiers: Compton profiles.

Compton profiles have been calculated for diamond with the self-consistent-field Hartree-Fock formalism reported earlier. The momentum density is the diagonal part of the double Fourier transform. The Compton profile is calculated from this, assuming the validity of the impulse approximation. Calculations are carried out along various crystalline directions in order to make comparisons with experiment. (Modified author abstract)

AD-780 367/9GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EVAPORATION OF A DROP IN THE PRESENCE OF A CONSIDERABLE INTERNAL HEAT RELEASE,
L. P. Semenov, and P. N. Svirkunov. 17 Apr 74, 27p Rept no. FTD-HT-23-891-74
Edited trans. of Institut Eksperimentalnoi Meteorologii. Trudy (USSR) n23 p91-107 1971, by Victor Mesenzeff.

Descriptors: *Evaporation, *Drops, Temperature, Numerical analysis, Translations, USSR.

AD-780 456/0GA PC$3.00/MF$1.45
Stanford Research Inst Menlo Park Calif
INELASTIC COLLISIONS OF EXCITED ATOMS.
Annual rept.,
James R. Peterson. 19 Jun 74, 20p Rept no. SRI-MP74-22
Contract N00014-70-C-0339

Descriptors: *Helium, *Gas ionization, *Inelastic scattering, Potential energy, Inelastic scattering, Metastable state, Ground state, Excitation, Particle collisions, Reaction kinetics, Atomic energy levels, Energy transfer.
Identifiers: Atom atom interactions, Chemical reaction mechanisms.

The research effort is concerned with interactions of metastable electronically excited atoms with ground state atoms and molecules. Principal attention recently has been devoted to the study of ionization processes in the collisions of He(*) (2 doublet S) with ground state He: the reaction He(*) + He to He(+) + He + e(-). Experimental measurements were made using our metastable atom differential scattering apparatus. The experiment represents the first successful measurement of the collisional ionization of metastable atoms at these low energies, and is the first detailed analysis of the product ion energies and angles that has been made at any energy. Three separate ionization processes have been clearly identified, and at least one more appears to be present in the data. It has been possible to interpret all these processes in terms of specific interactions between molecular states in the collision complex.

AD-780 468/5GA Reprint
Joint Inst for Lab Astrophysics Boulder Colo
TERATOMIC RECOMBINATION OF EXCITED RBXE,
C. G. Carrington, and Alan Gallagher. 28 Nov 73, 11p
Contract DAHC04-72-C-0047
Availability: Pub. in Jnl. of Chemical Physics, v60 n9 p3436-3444, 1 May 74.

Descriptors: *Rubidium compounds, *Recombination reactions, Emission spectra, Reaction kinetics, Excitation, Molecular energy levels, Particle collisions.
Identifiers: *Xenon compounds.

Free Rb is optically excited to RB*(5 doublet P(1/2)) in the presence of Xe gas, and the RbXe fluorescence is measured as a function of xenon pressure. The teratomic recombination process, Rb* + 2Xe to RbXe* + Xe, and other collision processes compete with radiative decay. The radiative rate is known, so collisional rates can be inferred from the data. The molecular spectrum is observed as a continuum, whose intensity profile yields the bound-state vibrational distribution at each xenon pressure. The low-pressure limit of this distribution yields the teratomic recombination rate as a function of vibrational state, and the total recombination rate constant. The transition from this initially formed distribution to the high-pressure equilibrium distribution is reported. (Modified author abstract)

AD-780 469/3GA PC$3.25/MF$1.45
Belfer Graduate School of Science New York
INTRAMOLECULAR REARRANGEMENTS OF FIVE- AND SIX-COORDINATE SYSTEMS.
Technical rept.,
Jeremy I. Musher. 6 Jun 74, 33p Rept no. TR-11
Contract N00014-68-A-0302-0005

Descriptors: *Molecular isomerism, *Stereochemistry, *Complex compounds, Reviews, Chelate compounds.
Identifiers: *Rearrangement reactions, Chemical reaction mechanisms.

The modes of intramolecular rearrangement of five- and six-coordinate systems are reviewed in detail. Trigonal bipyramids, square-pyramids, dihydro octahedral and tris-chelate octahedral compounds are discussed. (Author)

AD-780 470/1GA Reprint
Joint Inst for Lab Astrophysics Boulder Colo
POTENTIALS AND CONTINUUM SPECTRA OF RB-NOBLE GAS MOLECULES,
D. L. Drummond, and Alan Gallagher. 28 Nov 73, 9p
Contract DAHC04-72-C-0047
Availability: Pub. in Jnl. of Chemical Physics, v60 n9 p3426-3435, 1 May 74.

Descriptors: *Rubidium compounds, *Emission spectra, Fluorescence, Spectrum analysis, Molecular energy levels, Potential energy, Excitation, Ground state.
Identifiers: *Rare gas compounds, Line broadening.

Rubidium vapor is optically excited by either of the atomic resonance lines in the presence of typically 400 Torr of He, Ne, Ar, Kr, or Xe. Normalized emission spectra of the far wings of these resonance lines are then measured as a function of temperature. These far wings, extending as much as 1000 A from the resonance lines, are interpreted as molecular continuum radiation of Rb-noble gas molecules. Using the quasistatic theory of line broadening, or the classical Franck-Condon principle, these spectra are analyzed to yield the ground and excited state molecular potentials. (Author)

AD-780 500/5GA Reprint
Pittsburgh Univ Pa Dept of Chemistry
ABSOLUTE RATE CONSTANT FOR O + NO CHEMILUMINESCENCE IN THE NEAR INFRARED,
Michael E. Golde, Aidan E. Roche, and Frederick Kaufman. 8 May 73, 8p
Contracts DA-31-124-ARO(D)-440, F19628-70-C-0255
Availability: Pub. in Jnl. of Chemical Physics, v59 n8 p3953-3959, 15 Oct 73.

Descriptors: *Chemiluminescence, Afterglows, Emission spectra, Reaction kinetics, Nitrogen oxides, Infrared radiation.
Identifiers: *Oxygen atoms, *Nitrogen oxide(NO).

Infrared chemiluminescence from the process O + NO (+ M) to NO2 + h(mu) (+ M) has been studied between 1.3 and 4.1 micrometers. The wavelength dependence of the continuum between 1.3 and 3.3 micrometers is in fair agreement with previous studies and the measured radiative rate constant at 1.51 micrometers establishes the NO-O glow in this spectral range as a secondary emission standard. In the region 3.3-4.1 micrometers, the previously observed broad band shows a complex kinetic dependence on (O) and (M). (Modified author abstract)

AERE-R-7646 PC$4.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
SOME APPLICATIONS AT HARWELL OF NONDESTRUCTIVE GAMMA --PHOTON ACTIVATION ANALYSIS.
J. S. Hislop. Jan 74, 19p

Descriptors: (*Iron, *Activation analysis), (*Calcium, Activation analysis), (*Titanium, Activation analysis), Air filters, Antimony, Arsenic, Biological materials, Bismuth, Cadmium, Carbon, Cerium, Cesium, Chromium, Diamonds, Gamma spectroscopy, Lead, Lunar materials, Magnesium, Manganese, Molybdenum, Nickel, Nitrogen, Nondestructive analysis, Performance, Photon beams, Photonuclear reactions, Quantitative chemical analysis, Rubidium, Sensitivity, Silver, Skeleton, Sodium, Strontium, Thallium, Uses, Vanadium, Zinc, Zirconium.

For abstract, see NSA 29 12, number 28961.

BNL-18604 PC$4.75/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
COMPOSITIONAL GROUPINGS OF SOME ANCIENT AEGINA AND EASTERN MEDITERRANEAN POTTERY.
A. M. Jr. Bieber, D. W. Brooks, G. Harbottle, and E. V. Sayre. 1973, 54p CONF-730575-9

Descriptors: (*Archaeological specimens, *Activation analysis), Elements, Neutron reactions, Trace amounts.

For abstract, see NSA 29 12, number 28962.

BNL-18629 PC$5.75/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
STUDY OF THE MATERIAL AND TECHNIQUES USED BY SOME NINETEENTH CENTURY AMERICAN OIL PAINTERS BY MEANS OF NEUTRON ACTIVATION AUTORADIOGRAPHY.
M. J. Cotter, P. Meyers, L. van Zelst, C. H. Olin, and E. V. Sayre. 1973, 53p CONF-730575-10

Descriptors: (*Pigments, *Activation analysis), Archaeological specimens, Autoradiography, Neutron reactions, Thermal neutrons.

For abstract, see NSA 29 12, number 28963.

BNL-18662 PC$3.75/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
ANALYTICAL COMPARISON OF VARIOUS EGYPTIAN SOILS, CLAYS, SHALES, AND SOME ANCIENT POTTERY BY NEUTRON ACTIVATION.
S. K. Tobia, and E. V. Sayre. 1973, 35p CONF-730416-5

Descriptors: (*Archaeological specimens, *Activation analysis), (*Clays, Activation analysis), (*Soils, Activation analysis), (*Shales, Activation analysis), Impurities, Neutron reactions.

For abstract, see NSA 29 12, number 28964.

BUP-59 PC$4.00/MF$1.45
Bergen Univ. (Norway). Dept. Of Physics.
SCALING LAW FOR PROTON IONIZATION CROSS SECTIONS FOR DIFFERENT TARGET ELEMENTS.
R. Karmaker, and L. Kocbach. Dec 73, 17p

Descriptors: (*Hydrogen ions 1 plus, *Ion collisions), (*Heavy ions, Ion collisions), Binary encounter method, Comparative evaluations, Cross sections, Ionization, Mathematical models, Protons, Scaling laws, Semiclassical approximation, Targets.

For abstract, see NSA 29 12, number 30458.

CEA-CONF-2496 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France).
STUDY OF HEAVY METALS IN THE GRASS-MILK PRODUCT CHAIN BY MEANS OF NEUTRON ACTIVATION AND ATOMIC ABSORPTION.
C. Bruant, J. P. Bruant, M. Neuburger, L. Vassal, and C. Disant. 1973, 18p CONF-730817-5
In French.

Descriptors: (*Mercury, *Activation analysis), (*Copper, Activation analysis), (*Zinc, Activation analysis), (*Lead, *Absorption spectroscopy), Cadmium, Chemical analysis, Fission products, Food chains, Grass, Milk products, Multi-element analysis, Neutron reactions, Quantitative chemical analysis.

For abstract, see NSA 29 12, number 28965.

COM-74-50510/8GA Not available NTIS.
National Bureau of Standards, Washington, D.C.
PHOTODISSOCIATIVE FORMATION OF ION PAIRS FROM MOLECULAR HYDROGEN AND THE ELECTRON AFFINITY OF THE HYDROGEN ATOM.
Final rept.,
K. E. McCulloh, and J. A. Walker. 1 Apr 74, 4p
Pub. in Chemical Physics Letters, v25 n3 p439-442, 1 Apr 74.

Descriptors: *Hydrogen, *Deuterium, Ionization.
Identifiers: *Photodissociation, *Electron affinity.

Photodissociative production of ion pairs from H2 has been observed in the wavelength range 706-718 A. From measured thresholds or production of H(-) from H2 molecules in each of the three lowest rotational states, the lower bound electron affinity is obtained. For formation of D(-) from D2, a threshold assigned to molecules in the rotational state J = 2 has been measured. Negative ion yield curves are presented for hydrogen.

COM-74-50512/4GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ESCA STUDY OF CARBON MONOXIDE AND OXYGEN ADSORPTION ON TUNGSTEN.
Final rept.,
John T. Yates, Jr., Theodore E. Madey, and Nils E. Erickson. 1974, 18p
Pub. in Surface Science, v43 p257-274 1974.

Descriptors: *Chemisorption, *Oxygen, *Carbon monoxide, Desorption, Molecular energy levels, Tungsten, Adsorption, Chemical bonds, Surface chemistry.
Identifiers: X ray photoelectron spectroscopy, Photoelectron spectroscopy.

The chemisorption of both CO and O2 on a clean tungsten ribbon has been studied using an ultrahigh vacuum x-ray photoelectron spectrometer. For CO, the energy and intensity of photoemission from O(1s) and C(1s) core levels have been studied for various adsorption temperatures.

COM-74-50513/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
THE CLAUSIUS-MOSSOTTI FUNCTIONS (MOLAR POLARIZABILITIES) OF PURE COMPRESSED GASEOUS AND LIQUID METHANE, ETHANE, PROPANE, BUTANES AND NITROGEN.
Final rept.,
D. E. Diller. Apr 74, 2p
Pub. in Cryogenics, v14 n4 p215-216 Apr 74.

Descriptors: *Alkanes, Dielectric properties, Methane, Ethane, Propane, Butanes, Nitrogen.
Identifiers: *Polarizability, *Clausius-Mossotti functions.

The report gives accurate interpolation functions for the Clausius-Mossotti functions (molar polarizabilities) of pure compressed gaseous and liquid methane, ethane, propane, butanes and nitrogen; and suggests a method for calculating the dielectric constants or the densities of their mixtures. The accuracy of calculated Clausius-Mossotti functions for mixtures containing a high concentration of methane is expected to be better than 1% using only data for the pure components. Additional data for the dependence of the excess Clausius-Mossotti function on composition could reduce the uncertainty in Clausius-Mossotti functions for multicomponent mixtures to less than 0.2%.

COM-74-50514/0GA Not available NTIS.
National Bureau of Standards, Washington, D.C.
SURFACE MOLECULES AND CHEMISORPTION. I. ADATOM DENSITY OF STATES.
Final rept.,
J. W. Gadzuk. 1974, 17p
Pub. in Surface Science, v43 p44-60 1974.

Descriptors: *Chemisorption, Surface chemistry, Molecular orbitals, Chemical bonds, Metals, Molecular energy levels.

A useful picture of chemisorption on metal surfaces is one in which a localized molecule is formed between the adatom and its nearest neighbor substrate atoms. The interaction responsible for the molecule formation is treated as the coupling between the adsorbate state and a group orbital formed from a linear combination of atomic orbitals of the substrate atoms. Within the surface molecule picture, level width and level shift functions, given by Newns modification of the Anderson theory, have been calculated and the resulting adatom density of states function has been obtained. This has been done for model systems in which the substrate is either a free electron metal or a tightbinding p-band metal and the adsorbate is s or p like. The results show how it is possible to simultaneously have narrow virtual levels due to chemisorption (about 1 eV) which previously implied weak interactions and also high binding energies (approximately = or >3 eV) as are observed experimentally.

COM-74-50517/3GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MICROWAVE SPECTRUM OF 13C METHANOL.
Final rept.,
S. S. Haque, R. M. Lees, J. M. Saint Clair, Yardley Beers, and Donald R. Johnson. 1 Jan 74, 3p
Pub. in Astrophysics Jnl. v187 p115-117, 1 Jan 74.

Descriptors: *Methyl alcohol, Microwave spectra, Extraterrestrial radio waves, Molecular rotation, Carbon isotopes, Molecular energy levels, Spectrum analysis.
Identifiers: Carbon 13.

Laboratory measurements of the frequencies of some astronomically interesting transitions of the 13C isotopic species of methanol are reported. Lines in the 94, 142, and 189 GHz regions have been measured, as well as a number of transitions in the 14-50 GHz region. The standard deviation of fit with the constants given is 0.098 MHz. The remaining measured lines in these R-branch patterns have been predicted with an uncertainty of 0.3 MHz.

COM-74-50524/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
INFRARED AND RAMAN SPECTRA OF ETHYNYLDIFLUOROBORANE (HC2BF2) AND ETHYNYLDICHLOROBOBORANE (HC2BCL2).
Final rept.,
J. Michael Burk, J. J. Ritter, and Walter J. Lafferty. 1974, 7p
Pub. in Spectrochimica Acta, v30A p993-999 1974.

Descriptors: *Infrared spectra, *Raman spectra, *Boranes, Molecular vibration, Spectrum analysis.
Identifiers: Borane/difluoro-ethynyl, Borane/dichloro-ethynyl.

The vapor phase infrared and Raman spectra of several isotopic species of ethynyldifluoroborane (HC2BF2) and ethynyldichloroborane (HC2BCl2) have been obtained. Vapor phase band contours, Raman polarization data, characteristic group frequencies, and isotopic frequency shifts have been used to make the vibrational assignments for these molecules.

COM-74-50525/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MEASUREMENT OF TOTAL CROSS SECTIONS FOR ELECTRON RECOMBINATION WITH NO(+) AND O2(+) USING ION STORAGE TECHNIQUES.
Final rept.,
F. L. Walls, and G. H. Dunn. 1 May 74, 5p
Pub. in Jnl. of Geophysical Research, v79 n13 p1911-1915, 1 May 74.

Descriptors: *Nitrogen oxide(NO), *Oxygen, *Electron capture, Recombination reactions, Ions, Cross sections, Electron energy.

The total cross section as a function of electron energy for recombination of electrons with room temperature NO(+) has been measured with a trapped ion technique. Similar measurements were made on O2(+), the species used to calibrate the apparatus geometry. A Maxwellian distribution of electron velocities was used with the measured cross sections to calculate rate constants, giving values extending to electron temperatures as high as 40,000K. Comparison with previously measured rate coefficients at lower temperatures is quite satisfactory.

COM-74-50526/4GA Not available NTIS.
National Bureau of Standards, Washington, D.C.
HEAT CAPACITIES OF SELENIUM CRYSTAL (TRIGONAL), GLASS, AND LIQUID FROM 5 TO 360K.
Final rept.,
S. S. Chang, and A. B. Bestul. 1974, 20p
Pub. in Jnl. of Chemical Thermodynamics, v6 p325-344 1974.

Descriptors: *Selenium, *Specific heat, Cryogenics, Glass transition temperature, Thermodynamic properties, Trigonal lattices, Supercooling.

Heat capacities of high purity selenium (better than 99.999 moles per cent) have been measured for the trigonal crystal from 5 to 360K, for the quenched and annealed glasses from 5K to Tg (around 300K) and for the super-cooled liquid from Tg to 340K. The glass transformation temperature Tg, as determined from plots of H against T, is 304K for the quenched glass and 295K for the annealed glass, CP, of the glass is higher than that of the crystal over the entire temperature range of investigation.

COM-74-50528/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
MULTI-CONFIGURATION SELF-CONSISTENT-FIELD CALCULATION OF THE DISSOCIATION ENERGY AND ELECTRONIC STRUCTURE OF HYDROGEN FLUORIDE.
Final rept.,
M. Krauss, and D. Neumann. 1974, 5p
Pub. in Molecular Physics, v27 n4 p917-921 1974.

Descriptors: *Hydrogen fluoride, *Molecular energy levels, Dissociation energy, Wave functions, Dipole moments.
Identifiers: Configuration interaction method, Electronic states.

The optimized valence configuration method of Wahl and Das is applied to a study of the electronic structure of HF at the equilibrium internuclear separation. A compact eight configuration wave function is found to yield an accurate dissociation energy and dipole moment.

COM-74-50530/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
POTENTIALS AND CONTINUUM SPECTRA OF RB-NOBLE GAS MOLECULES.
Final rept.,
D. L. Drummond, and A. Gallagher. May 74, 10p
Contract DAHC04-72-C-0047
Pub. in Jnl. of Chemical Physics, v60 n9 03426-3435, 1 May 74.

Descriptors: *Rubidium inorganic compounds, *Rare gas compounds, Potential energy, Molecular energy levels, Spectrum analysis, Emission spectra, Ground state, Excitation.
Identifiers: Line broadening.

Rubidium vapor is optically excited by either of the atomic resonance lines in the presence of typically 400 Torr of He, Ne, Ar, Kr, or Xe. Normalized emission spectra of the far wings of these resonance lines are then measured as a function of temperature. These far wings, extending as much as 1000 A from the resonance lines, are interpreted as molecular continuum radiation of Rb-noble gas molecules. Using the quasi-static theory of line broadening, or the classical Franck-Condon principle, these spectra are analyzed to yield the ground and excited state molecular potentials.

COM-74-50531/4GA Not available NTIS.
National Bureau of Standards, Washington, D.C.
TERATOMIC RECOMBINATION OF EXCITED RBXE.
Final rept.,
C. G. Carrington, and A. Gallagher. 1 May 74, 9p
Contract DAHC04-72-C-0047
Pub. in Jnl. of Chemical Physics, v60 n9 p3436-3444, 1 May 74.

Descriptors: *Rubidium inorganic compounds, *Xenon compounds, *Recombination reactions, Molecular spectra, Spectrum analysis, Molecular energy levels, Excitation, Fluorescence, Atomic energy levels, Reaction kinetics, Pressure, Particle collisions, Emission spectra.

Free Rb(5 doublet S) is optically excited to Rb*(5 doublet P(1/2)) in the presence of Xe gas, and the fluorescence is measured as a function of xenon pressure. The teratomic recombination process, Rb*+2Xe to RbXe*+Xe, and other collision processes compete with known radiative decay rates, so collisional rates can be inferred from the data. The molecular spectrum is observed as a continuum, whose intensity profile yields the bound-state vibrational distribution at each xenon pressure. The low-pressure limit of this distribution yields the teratomic recombination rate as a function of vibrational state, and the total 300K recombination rate constant. The RbXe potentials are also obtained from analysis of the spectrum in the zero-pressure and high-pressure limits.

CONF-740510-1 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
COMBINED SOLVENT EXTRACTION-LIQUID SCINTILLATION METHODS FOR RADIOASSAY OF ALPHA EMITTERS.
W. J. McDowell, and C. F. Coleman. 1974, 16p

Descriptors: (*Plutonium, *Scintillation counting), (*Uranium, Scintillation counting), (*Curium, Scintillation counting), (*Neptunium, Scintillation counting), Alpha spectroscopy, Americium, Berkelium, Californium, Radiometric analysis, Solvent extraction.

For abstract, see NSA 29 12, number 29041.

COO-2166-11 PC$4.25/MF$1.45
Michigan Technological Univ., Houghton (Usa). Dept. Of Metallurgical Engineering.
EXPERIMENTAL TECHNIQUES FOR STUDYING GRAIN BOUNDARY CHEMISTRY.
D. F. Stein, W. C. Johnson, and C. L. White. 1973, 42p CONF-730727-2
Contract AT(11-1)-2166

Descriptors: (*Grain boundaries, *Chemical reactions), Chemical analysis, Crystals, Impurities.

For abstract, see NSA 29 12, number 31623.

COO-2217-5 PC$4.25/MF$1.45
Illinois Inst. Of Tech., Chicago (Usa).
INVESTIGATION OF MOLECULAR MECHANISMS IN PHOTODYNAMIC ACTION AND RADIOBIOLOGY WITH NANOSECOND FLASH PHOTOLYSIS AND PULSE RADIOLYSIS. PROGRESS REPORT, JULY 1, 1973--JUNE 30, 1974.
L. I. Grossweiner. 1974, 24p
Contract AT(11-1)-2217

Descriptors: (*Iodides, *Photolysis), (*Octadecanoic acid, *Radiolysis), (*Thymine, Radiolysis), Chemical radiation effects, Chemical reaction kinetics, Electron reactions, Electron spin resonance, Eosin, Gamma radiation, Laser radiation, Membranes, Organic polymers, Oxidation, Oxygen, Pulsed irradiation, Sensitizers, Visible radiation.

For abstract, see NSA 29 12, number 29075.

COO-2271-24 PC$4.25/MF$1.45
Columbia Univ., New York (Usa). Dept. Of Physics.
EFFECTS OF RETARDATION ON ELECTROMAGNETIC SELF-ENERGY OF ATOMIC STATES.
C. K. Au, and G. Feinberg. 1972, 24p

Descriptors: (*Hydrogen, *Spectral shift), (*Atoms, *Energy levels), Absorption, Compton effect, Emission, Green function, Lamb shift, Mass, Photons, Relativistic range, Renormalization, Self-energy.

For abstract, see NSA 29 12, number 30475.

COO-3247-25 PC$5.00/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, PA. (Usa).
GENERALIZED OSCILLATOR STRENGTHS. PROGRESS REPORT, JULY 1, 1973--JULY 1, 1974.
E. N. Lassettre. 1974, 36p
Contract AT(11-1)-3247

Descriptors: (*Electron-molecule collisions, *Excitation), (*Electron-atom collisions, Excitation), Cross sections, Energy-level transitions, Ev range 100-1000, Research programs, Scattering.

For abstract, see NSA 29 12, number 30459.

FRNC-TH-468 PC$6.75/MF$1.45
Grenoble-1 Univ., 38 (France).
DETERMINATION OF 11 RARE EARTH ELEMENTS IN VEGETATION USING ACTIVATION ANALYSIS. ABSORPTION OF TB BY EXCISED ZEA MAYS ROOTS.
R. Danne. 1970, 73p
In French.

Descriptors: (*Rare earths, *Activation analysis), (*Plants, Activation analysis), (*Terbium, *Root absorption), Thermal neutrons, Gamma spectra, Ion exchange chromatography, Leaves, Trace amounts, Calcium ions, Dinitrophenol, Maize, Ph value, Temperature dependence.

For abstract, see NSA 29 12, number 28967.

GKSS-74-E-4 PC$4.00/MF$1.45
Gesellschaft fuer Kernenergieverwertung in Schiffbau und Schiffahrt M.B.H., Geesthacht-Tesperhude (F.R. Germany).
CONCENTRATION DEPENDENCE OF THE MOLECULAR CROSS SECTION OF THE SOLUTIONS OF METHANOL AND WATER IN HEAVY WATER.
A. Suszkin. 1974, 9p

Descriptors: (*Water, *Chemical bonds), (*Heavy water, Chemical bonds), (*Methanol, Chemical bonds), Aqueous solutions, Molecular structure, Quantity ratio.

For abstract, see NSA 29 12, number 29076.

HEDL-SA-649 PC$4.50/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
REVIEW OF METHODS FOR MEASURING STAINLESS STEEL INTERSTITIAL ELEMENTS IN SODIUM-APPLICATION TO LMFBR'S.
J. J. McCown, and J. L. Ballif. 1973, 30p CONF-740301-4
Contract AT(45-1)-2170

Descriptors: (*Sodium, *Quantitative chemical analysis), (*Oxygen, Quantitative chemical analysis), (*Carbon, Quantitative chemical analysis), (*Hydrogen, Quantitative chemical analysis), Coolant loops, Liquid metals, Reviews.

For abstract, see NSA 29 12, number 29608.

INP-850 PC$4.25/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
PREPARATION OF HIGH PURITY MAGNESIUM OXIDE. 2. REMOVAL OF TRACE AMOUNTS OF IMPURITIES FROM MAGNESIUM NITRATE SOLUTIONS.
A. Debska-Horecka, J. Kulik, and I. Stronski. Jul 73, 21p

Descriptors: (*Magnesium nitrates, *Purification), (*Magnesium, *Coprecipitation), (*Iron, Coprecipitation), (*Barium, Coprecipitation), Aqueous solutions, Calcium, Cobalt, Edta, Magnesium compounds, Nickel, Quinolines, Silver, Sodium, Strontium, Trace amounts, Tracer techniques, Yttrium, Zinc.

For abstract, see NSA 29 12, number 29054.

IS-T-612 PC$10.00/MF$1.45
Ames Lab., Iowa (Usa).
SOME PROPERTIES OF YTTRIUM AND RARE-EARTH N'-METHYLETHYLENEDIAMINE-N',N,N-TRIACETATE COMPLEXES.
D. A. Johnson. Apr 74, 140p
Contract W-7405-eng-82

Descriptors: (*Lanthanum, *Ion exchange), (*Cerium, Ion exchange), (*Praseodymium, Ion exchange), (*Neodymium, Ion exchange), Carboxylic acids, Europium, Gadolinium, Rare earth complexes, Samarium, Terbium, Yttrium complexes.

For abstract, see NSA 29 12, number 29055.

IS-T-621 PC$12.75/MF$1.45
Ames Lab., Iowa (Usa).
RARE EARTH ION ACTIVITIES BY STATIC VAPOR AND SPECIFIC ION ELECTRODE MEASUREMENTS WITH APPLICATION TO A SINGLE COMPONENT SOLVENT EXTRACTION SYSTEM.
W. G. O'Brien. Apr 74, 193p
Contract W-7405-eng-82

Descriptors: (*Neodymium nitrates, *Chemical reaction kinetics), (*Lanthanum nitrates, *Vapor pressure), (*Neodymium, *Solvent extraction), Aqueous solutions, Cations, Hdehp, Hydrogen ions, Measuring instruments, Neodymium compounds, Partition.

For abstract, see NSA 29 12, number 29077.

IS-3342 PC$10.50/MF$1.45
Ames Lab., Iowa (Usa).
VAMP: A LIBRARY OF FORTRAN PROGRAMS FOR SOLVING THE VIBRATIONAL SECULAR EQUATION FOR THE ANALYSIS OF POLYATOMIC MOLECULES.
T. G. Pinter, and G. L. Orr. Feb 74, 147p
Contract W-7405-eng-82

Descriptors: (*Molecules, *Emission spectra), (*Computer codes, *V codes), Fortran, Ibm computers, Intermolecular forces.

For abstract, see NSA 29 12, number 30476.

ITF-73-180-P PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
EXCITON STATES IN TWO-DIMENSIONAL MOLECULAR STRUCTURES.
A. S. Davydov, and N. I. Kislukha. 1973, 16p
In Russian.

Descriptors: (*Molecular structure, *Excitons), Deformation, Energy levels, Excitation, Interactions, Resonance, Van der waals forces.

For abstract, see NSA 29 12, number 31618.

JINR-E7-7688 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
EXCITATION OF KX-RAYS BY BOMBARDMENT OF THICK SOLID TARGETS WITH 150 MEV XE IONS.
P. Gippner, K. H. Kaun, W. Neubert, F. Stary, and W. Schulze. 1974, 20p

Descriptors: (*Xenon ions, *Collisions), (*Gadolinium, *Ion collisions), (*Tin, Ion collisions), (*Xenon 136, Ion collisions), Atomic number, Cadmium, Cross sections, Electronic structure, Excitation, Indium, Iridium, Mev range 100-1000, Molecular orbital method, Molybdenum, Niobium, Palladium, Platinum, Rhodium, Tantalum, Terbium, X radiation, Ytterbium.

For abstract, see NSA 29 12, number 30460.

KFK-1888 PC$6.00/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Radiochemie.
SIMULTANEOUS DETERMINATION OF EXP 235 U AND EXP 239 PU TRACES BY GAMMA-SPECTROMETRIC ANALYSIS OF NOBLE FISSION GASES FOLLOWING NEUTRON ACTIVATION.
A. H. Hawa, and A. von Baeckmann. Jan 74, 59p
In German.

Descriptors: (*Uranium 235, *Activation analysis), (*Plutonium 239, Activation analysis), (*Krypton 88, *Fission yield), (*Xenon 138, Fission yield), Accuracy, Cesium 139, Errors, Fission products, Gamma spectroscopy, Neutron reactions, Rubidium 88, Thermal neutrons, Trace amounts.

For abstract, see NSA 29 12, number 28969.

LA-UR-74-356 PC$3.25/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
EFFECT OF PARTICLE SIZE ON THE CARRIER-DISTILLATION ANALYSIS OF PUO SUB 2 .
C. J. Martell. 1974, 22p CONF-740314-1

Descriptors: (*Plutonium oxides, *Chemical analysis), (*Iron, *Emission spectroscopy), (*Chromium, Emission spectroscopy), (*Nickel, Emission spectroscopy), Cobalt, Particle size, Quantitative chemical analysis, Silicon.

For abstract, see NSA 29 12, number 29011.

LA-UR-74-429 PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
LASER INDUCED RECOVERY OF DEUTERIUM OR TRITIUM FROM WATER.
R. J. Jensen, and J. L. Lyman. 9p CONF-740416-1
Contract W-7405-eng-36

Descriptors: (*Deuterium, *Laser isotope separation), (*Tritium, Laser isotope separation), (*Hydrogen isotopes, Laser isotope separation), Heavy water, Reaction kinetics, Water.

For abstract, see NSA 29 12, number 29093.

LBL-2507 PC$8.75/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
HIGH-TEMPERATURE MASS SPECTROMETRY.
J. A. Jr. Roberts. Feb 74, 112p
Contract W-7405-eng-48

Descriptors: Cerium fluorides, Enthalpy, Entropy, Gallium sulfides, High temperature, Lanthanum fluorides, Mass spectroscopy, Temperature dependence.

For abstract, see NSA 29 12, number 31625.

MLM-2110 PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio (Usa).
EFFECT OF ISOTOPIC EXCHANGE AND DILUTION ON HTO PERMEATION.
G. C. Abell. 6 Mar 74, 9p
Contract AT-33-1-GEN-53

Descriptors: (*Heavy water, *Diffusion), (*Tritium compounds, Diffusion), (*Water, Diffusion), (*Membranes, *Permeability), Hydrogen, Isotope dilution, Isotopic exchange, Polyvinyl chloride, Pvc, Tritium.

For abstract, see NSA 29 12, number 29078.

ORNL-TM-4370 PC$30.50/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
CHEMICAL DEVELOPMENT SECTION B SEMIANNUAL PROGRESS REPORT, MARCH 1, 1973 TO AUGUST 31, 1973. PART I.
C. D. Scott, C. A. Burtis, D. J. Crouse, L. M. Ferris, and J. C. Mailen. Feb 74, 567p
Contract W-7405-eng-26

Descriptors: (*Radioactive waste disposal, *Research programs), (*Separation processes, Research programs), Chemistry, Leading abstract, Reprocessing, Water pollution.

For abstract, see NSA 29 12, number 29056.

PATENT-3 131 137 Not available NTIS
Department of Agriculture, Washington, D.C.
METHOD FOR CONDUCTING AN ELECTROCHEMICAL OXIDATION.
Patent, *Filed 19 Jul 62, patented 28 Apr 64, Earl B. Lancaster, Howard F. Conway, and Frank C. Wohlrabe. 28 Apr 64, 5p PAT-APPL-211 145, Previously filed as PAT-APPL-859 824, 15 Dec 59. Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Electrolytic cells, *Oxidation, Iodates, Periodates, Polysaccharides, Starches.
Identifiers: PAT-CL-204-82.

The invention pertains to the oxidation of sodium iodate to sodium periodate for the 'out-cell' oxidation of polysaccharides such as starch, cellulose, and the like to the substantially fully oxidized form, e.g., dialdehyde starch. Iodic acid can be oxidized to periodic acid and, concurrently, starch to dialdehyde starch in a concentric cell in which the distance of a suspended, thimble-like porous ceramic diaphragm containing the catholyte and having suspended therein a steel rod cathode, is uniformly no more than one inch and is preferably between 0.7-0.5 inch distant from the inner wall of a concentrically disposed annular anode, which can be made of ordinary lead pipe.

PB-232 928/2GA PC$3.00/MF$1.45
Chemical Abstracts Service, Columbus, Ohio.
DERIVATION OF THE REGISTRY III STRUCTURE RECORD,
P. G. Dittmar. Jan 74, 16p CAS-200
Contract NSF-C656

Descriptors: *Molecular structure, *Nomenclature, Information systems, Index registers, Data processing, Chemical compounds, Identification systems, Editing routines.
Identifiers: *Registry system, *Chemical nomenclature.

An adjustment to the Registry System known as Registry III has been designed to provide more efficient and extensive support to the indexing of documents handled by Chemical Abstracts Service. This paper deals in outline with the main adjustment to the Registry System effected by Registry III – the reorganization and extension of the Structure Record. The following pages describe step-by-step the input and registration of a typical structure. After input, the programs first deal with the entire structure, then with component cyclic systems, lastly creating a record identifying the way the various components are joined within the structure.

TLU-22-73 PC$4.00/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
FAST METHOD FOR NITROGEN DETERMINATION IN SINGLE SEEDS.
B. Sundqvist, L. Goenczi, R. Bergman, and U. Lindh. Oct 73, 12p

Descriptors: (*Seeds, *Nuclear reaction analysis), (*Nitrogen, Nuclear reaction analysis), Barley, Deuteron reactions, Mev range 01-10, Nitrogen 14, Radiometric analysis, Wheat.

For abstract, see NSA 29 12, number 28970.

UCRL-75096 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SMALL, MINI-COMPUTER-AUTOMATED THERMOANALYTICAL LABORATORY.
E. Catalano, and J. C. English. 28 Nov 73, 8p
CONF-740315-1

Descriptors: (*Chemical analysis, *Laboratory equipment), Automation, Differential thermal analysis, Thermal gravimetric analysis.

For abstract, see NSA 29 12, number 31628.

Y-1937 PC$4.00/MF$1.45
Oak Ridge Y-12 Plant, Tenn. (Usa).
IN-SITU CHARACTERIZATION OF COMMON IMPURITIES IN URANIUM METAL BY SPARK SPECTROCHEMISTRY.
H. G. King. 29 Mar 74, 16p
Contract W-7405-eng-26

Descriptors: (*Uranium, *Chemical analysis), (*Copper, *Emission spectroscopy), (*Iron, Emission spectroscopy), (*Molybdenum, Emission spectroscopy), Carbon, Nickel, Niobium, Quality control, Quantitative chemical analysis, Silicon, Spectrometers, Titanium, Zirconium.

For abstract, see NSA 29 12, number 29013.

7E. Radio and Radiation Chemistry

AD-779 811/9GA PC$3.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CHEMICAL ACTION OF LASER RADIATION,
V. L. Talrozz, and P. O. Barashev. 19 Apr 74, 59p
Rept no. FTD-MT-24-500-74
Edited machine trans. of Vsesoyuznoe Khimicheskoe Obshchestva. Zhurnal (USSR) v18 n1 p15-33 1973, by Bernard L. Tauber.

Descriptors: *Coherent optical radiation, *Photochemical reactions, Dissociation, Optical pumping, Translations, Excitation, Transitions, USSR, Photolysis, Pyrolysis, Radiation chemistry, Chemical reactions, Lasers.

AD-779 887/9GA PC$3.25/MF$1.45
Stanford Research Inst Menlo Park Calif
MULTIPHOTON DETACHMENT OF NEGATIVE IONS.
Technical rept.,
N. M. Kroll, and K. M. Watson. Mar 74, 33p Rept no. SRI-JSR-73-6
Contract DAHC15-73-C-0370, ARPA Order-2504

Descriptors: *Oxygen, Gas ionization, Theory, Anions, Electron transitions, Lasers, Rates, Photochemical reactions, Absorption, Mathematical models.
Identifiers: *Electron detachment, *Multiphoton absorption.

A theory is presented to describe multiphoton detachment of negative ions by intense laser beams. The detachment rate is expressed in terms of the single-photon detachment rate. Numerical results are presented for detachment of electrons from O(-) and O2(-). Critical comments are given concerning some theories of multiphoton ionization. (Author)

CEA-CONF-2473 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
DATING; RADIOTHERMOLUMINESCENCE WITH THERMOSTIMULATED EXOELECTRON EMISSION.
G. Portal, M. Petel, and H. Francois. May 73, 13p
CONF-730575-8
In French.

Descriptors: (*Age estimation, *Radioluminescence), (*Archaeological specimens, Age estimation), Thermoluminescence.

For abstract, see NSA 29 12, number 29391.

KFK-1848 PC$4.75/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Abt. Dekontaminationsbetriebe.
DEVELOPMENT OF A CLEANSER FOR DECONTAMINATION PURPOSES WITH CONTROLLED FOAMING CHARACTERISTICS.
S. Kunze. Dec 73, 35p
In German.

Descriptors: (*Surfaces, *Decontamination), (*Stainless steels, Decontamination), (*Epoxides, Decontamination), (*Pvc, Decontamination), Calcium 45, Cesium 137, Chelating agents, Cobalt 60, Detergents, Equipment, Ph value, Polyvinyl chloride, Removal, Ruthenium 106.

For abstract, see NSA 29 12, number 29134.

KFK-1927 PC$8.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Radiochemie.
COMPLEXING KINETICS OF TRANSPLUTONIUM ELEMENTS.
H. El-Rawi. Jan 74, 107p
In German.

Descriptors: (*Americium complexes, *Chemical reaction kinetics), (*Curium complexes, Chemical reaction kinetics), (*Californium complexes, Chemical reaction kinetics), (*Lanthanum complexes, Chemical reaction kinetics), Amino acids, Carboxylic acids, Ligands.

For abstract, see NSA 29 12, number 29135.

MLM-2108 PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio (Usa).
TOPICS IN AQUEOUS PLUTONIUM CHEMISTRY.
G. L. Silver. 15 Mar 74, 43p
Contract AT-33-1-GEN-53

Descriptors: (*Plutonium, *Chemical reactions), (*Iron, Chemical reactions), Aqueous solutions, Equilibrium, Mathematical models, Plutonium 238, Valence.

For abstract, see NSA 29 12, number 29136.

ORO-4062-13 PC$3.25/MF$1.45
Alabama Univ., University (Usa). Dept. Of Chemistry.
ELECTRON--ELECTRON DOUBLE RESONANCE INVESTIGATIONS OF IR-RADIATED ORGANIC CRYSTALS: THE INFLUENCE OF DEUTERIUM SUBSTITUTION.
L. D. Kispert, K. Chang, and P. S. Wang. 1973, 25p CONF-731067-1
Contract AT(40-1)-4062

Descriptors: (*Glycine, *Chemical radiation effects), (*Alanine-l, Chemical radiation effects), (*Deuterium, *Isotopic exchange), Acetates, Crystals, Eldor, Isotope effects, Low temperature, Potassium compounds, Radicals, X radiation.

For abstract, see NSA 29 12, number 29104.

TID-26487 PC$16.50/MF$1.45
International Atomic Energy Agency, Vienna (Austria).
SPECIALISTS MEETING OF DECONTAMINATION OF PLANT COMPONENTS FROM SODIUM AND RADIOACTIVITY, DOUNREAY EXPERIMENTAL REACTOR ESTABLISHMENT, THURSO, CAITHNESS, SCOTLAND, 9--12 APRIL 1973. SUMMARY REPORT.
1973, 290p

Descriptors: (*Sodium, *Removal), (*Reactor components, *Decontamination), Leading abstract, Liquid metal cooled reactors, Lmfbr type reactors, Surface cleaning.

For abstract, see NSA 29 12, number 29139.

8. EARTH SCIENCES AND OCEANOGRAPHY

8A. Biological Oceanography

COM-74-11089/1GA PC$5.75/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.
POTENTIAL BIOLOGICAL EFFECTS OF HYPOTHETICAL OIL DISCHARGES IN THE ATLANTIC COAST AND GULF OF ALASKA,
Stephen F. Moore, Gary R. Chirlin, Charles J. Puccia, and Bradley P. Schrader. 1 Apr 74, 206p*
MITSG-74-19 NOAA-74051504
Report to Council on Environmental Quality. Index No. 74-819-Cwm.

Descriptors: *Marine biology, *Water pollution, Oils, Offshore drilling, Environmental surveys, Accidents, Atlantic Ocean, Coasts, Indicator species, Benthos, Responses, Alaska Gulf.
Identifiers: *Oil spills, Oil pollution, Ecosystems, Water pollution effects(Animals), Water pollution effects(Plants).

The report is an analysis of the primary biological effects of potential oil discharges resulting from hypothetical oil production activity on the Atlantic/Alaskan outer continental shelf (OCS). Although emphasis is placed on analysis of impacts and recovery from large-volume infrequent accidental oil spills, small volume continuous discharges of hydrocarbons are also considered.

Effects of oil releases from offshore platforms and spills occurring at coastal terminals are assessed. Qualitative predictions are attempted which are a rough order of magnitude estimates of physical, chemical and biological changes likely to occur due to oil releases into the marine environment. The study consists of several principal parts: (1) an environmental inventory; (2) a summary of response and sensitivity of individual organisms to petroleum substances; (3) an analysis of population/community level responses to oil, especially population recovery from accidental spills; and (4) an assessment of potential effects of specific oil discharges associated with hypothetical OCS petroleum developments.

COM-74-11120/4GA PC$8.75/MF$1.45
University of Southern California, Los Angeles. Allan Hancock Foundation.
MARINE STUDIES OF SAN PEDRO BAY, CALIFORNIA. PART III. THERMAL TOLERANCE AND SEDIMENT TOXICITY STUDIES,
Dorothy F. Soule, and Mikihiko Oguri. Feb 74, 115p USC-SG-1-74 NOAA-74050901
Grant NOAA-043-158-45
See also Part 2, COM-73-11467.

Descriptors: *Ecology, *San Pedro Bay, *Marine biology, *Water pollution, Benthos, California, Toxicity, Heat tolerance, Sediments, Annelida, Mollusca, Gastropoda, Worms.
Identifiers: Ecosystems, Sea Grant program, *Thermal pollution, Polychaeta, Anchovies, Water temperature.

This is the third in a series of marine studies of San Pedro Bay, California. Emphasis is on thermal tolerance and sediment toxicity studies. The six studies are titled: Thermal effects and San Pedro Bay; Preliminary observations on the lower minimum temperature requirements of the Northern Anchovy; Effects of subnormal temperatures on some common Los Angeles Harbor animals; The effect of various water temperatures on the survival and reproduction in polychaetous annelids: Preliminary report; Tolerance of Littorina planaxis and L. scutulata to temperature changes (Mollusca, Gastropoda); and Preliminary investigations of the effects of resuspended sediment on two species of benthic polychaetes from Los Angeles Harbor.

COM-74-11121/2GA PC$4.50/MF$1.45
University of Southern California, Los Angeles. Allan Hancock Foundation.
MARINE STUDIES OF SAN PEDRO BAY, CALIFORNIA. PART IV. ENVIRONMENTAL FIELD INVESTIGATIONS,
Dorothy F. Soule, and Mikihiko Oguri. Feb 74, 107p USC-SG-2-74 NOAA-7405902
Grant NOAA-043-158-45
See also report dated Feb 74, COM-74-11120.

Descriptors: *Ecology, *San Pedro Bay, *Marine biology, *Water pollution, California, Fishes, Algae, Phytoplankton, Benthos, Populations, Seasonal variations, Abundance, Primary biological productivity, Coasts, Environmental surveys.
Identifiers: Ecosystems, Sea Grant program.

This is the fourth in a series of marine studies of San Pedro Bay, California. Four studies reporting on environmental field investigations are: Abundance, distribution, seasonality, and productivity of the fish populations in Los Angeles Harbor, 1972-73; A checklist of fishes from Los Angeles-Long Beach Harbors; Primary productivity in the Outer Los Angeles Harbor, and Preliminary investigations of benthic marine algae from the breakwaters protecting Los Angeles and Long Beach Harbors.

COM-74-50189-04/GA PC-GPO/MF$1.45-NTIS
National Marine Fisheries Service, Seattle, Wash.
MARINE FISHERIES REVIEW. VOLUME 36. NUMBER 4, APRIL 1974.
Monthly rept.,
Thomas A. Manar. Apr 74, 82p NOAA-74050601
Special report on the California Gray Whale.
Paper copy available from GPO $12.50/year as C55.310:36, $1.25/copy as C55.310:36/4.

Descriptors: *Whales, *Meetings, *Marine biology, *Peridicals, Cetacea, Animal physiology, Animal behavior, Animal migrations, Feeding habits, Animal nutrition, Blood analysis, Genetics, Aquatic animals, Mammals.
Identifiers: Marine mammals, Eschrichtius robustus, *California gray whales.

The issue contains papers presented at the California Gray Whale Workshop, University of California, San Diego, Scripps Institution of Oceanography, 21-22 August 1972. The symposium was sponsored by NOAA, National Marine Fisheries Service, Southwest Fisheries Center, La Jolla Lab, and U.S. Navy's Navy Undersea Center, San Diego.

COM-74-50189-04-01/GA (Order as COM-74-50189-04)
California Univ., San Diego, La Jolla. Anesthesia Lab.
RESPIRATION AND METABOLISM IN TWO BALEEN WHALE CALVES,
Eric A. Wahrenbrock, Gary F. Maruschak, Robert Elsner, and David W. Kenney. 1974, 8p NOAA-74050601-1, MFR-Paper-1045
Prepared in cooperation with Scripps Inst. of Oceanography, La Jolla, Calif., and Sea World, Inc., Dan Diego, Calif.
Included in Marine Fisheries Review, v36 n4 p3-9 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Respiration, *Metabolism, Cetacea, Animal physiology, Aquatic animals, Mammals.
Identifiers: Marine mammals, Eschrichtius robustus, *California gray whales.

Relative increases in body length and weight, lung volume, minute ventilation, and metabolic rate were similar to those in terrestrial mammals, as was the growth efficiency. Lung volume and metabolic rate could be predicted with only partial success from the relationships of those variables to body weight proposed by Tenney and Kleiber, perhaps due to immaturity in the whales. Compared to terrestrial mammals, the ratio of tidal volume to resting lung volume in the whale was large, while the ratio of wasted ventilation to tidal volume was small. The authors measured respiratory excursions of arterial O2 and CO2 tensions of 36 and 16 mm Hg, respectively, consonant with the relationships between respiratory rate, lung volume, tidal volume, and metabolic rate. (Modified author abstract)

COM-74-50189-04-02/GA (Order as COM-74-50189-04)
California Univ., San Diego, La Jolla.
BALLISTOCARDIOGRAPHY AS A TECHNIQUE FOR COMPARATIVE PHYSIOLOGY,
N. TySmith, and Eric A. Wahrenbrock. 1974, 7p NOAA-74050601-2, MFR-Paper-1046
Included in Marine Fisheries Review, v36 n4 p9-14 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Animal physiology, *Ballistocardiography, Cetacea, Cardiovascular system, Heart, Aquatic animals.
Identifiers: *California gray whales, Marine mammals, Eschrichtius robustus.

The ultra low-frequency ballistocardiogram was recorded on a young California gray whale. The tracing is remarkably similar to those obtained from man and mouse, both in amplitude and in form. The IJ amplitudes for mouse, man and whale were 2.6, 4.3, and 4.6 cm/sec/sec. We conclude that greater differences are caused by poor recording technique or by disease than by species differences. The major interspecies differences were seen in the timing of cardiac events, such as preejection or ejection time. These differences could be caused by differences in heart size.

COM-74-50189-04-03/GA (Order as COM-74-50189-04)
Noval Hospital, San Diego, Calif.
INVESTIGATION OF BLUBBER THICKNESS IN A GRAY WHALE USING ULTRASONOGRAPHY,
Michael P. Curran, and William M. Asher. 1974, 7p NOAA-74050601-3, MFR-Paper-1047
Included in Marine Fisheries Review, v36 n4 p15-20 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Animal nutrition, Cetacea, Aquatic animals, Tissues(Biology), Fats, Measurement, Ultrasonic radiation.
Identifiers: *California gray whales, Marine mammals, Eschrichtius robustus.

A captive juvenile gray whale, Eschrichtius robustus, was studied with ultrasound using A-mode technique. Measurements of blubber and fat thickness by means of selected tissue interfaces were made. Suture implantation depths were also measured. Ultrasound would be a reliable method for measuring blubber and fat thicknesses to give insight to a marine mammal's nutritional status.

COM-74-50189-04-04/GA (Order as COM-74-50189-04)
Naval Undersea Center, San Diego, Calif.
SURGICAL ATTACHMENT OF A TELEMETRY DEVICE TO THE DORSAL RIDGE OF A YEARLING CALIFORNIA GRAY WHALE, 'ESCHRICHTIUS ROBUSTUS',
John C. Sweeney, and Joel L. Mattsson. 1974, 4p NOAA-74050601-4, MFR-Paper-1048
Included in Marine Fisheries Review, v36 n4 p20-22 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Biotelemetry, Telemetering equipment, Implantation, Sutures, Polypropylene, Polyester fibers, Surgery.
Identifiers: *California gray whales, Marine mammals, Eschrichtius robustus.

Surgical attachment of an instrument package mounting device onto the dorsal ridge of a yearling female California gray whale, Eschrictius robustus, was accomplished through the utilization of four large polypropylene sutures. Use of polypropylene and polyester fabric meshes to induce tissue growth around the sutures was not successful. Post-operative therapy was beneficial in insuring adequate healing at the suture sites. The orginal polypropylene sutures were replaced the day before release by polyvinyl chloride coated stainless steel.

COM-74-50189-04-05/GA (Order as COM-74-50189-04)
California Univ., San Diego. Div. of Clinical Pathology.
SOME HEMATOLOGIC OBSERVATIONS ON THE CALIFORNIA GRAY WHALE,
Alfred Zettner. 1974, 4p NOAA-74050601-5, MFR-Paper-1049
Included in Marine Fisheries Review, v36 n4 p22-24 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Hematology, Aquatic animals, Cetacea.
Identifiers: *California gray whales, Marine mammals, Eschrichtius robustus.

Examination of the blood of the California gray whale, obtained shortly after its arrival at Sea World, San Diego revealed the following data: WBC-13.9 x 1000/cubic mm; RBC-2.4 x 10 to the 6th power/cubic mm; hemoglobin-10.0 g/100 ml; hematocrit-31 percent; MCV -128 cu microns; MCH-42.8 micromicrograms; MCHC-32.4 percent. Hemoglobin electrophoresis showed a single hemoglobin band with a mobility similar to that of human hemoglobin F. The whale hemoglobin was 100 percent alkali resistant. No changes of this

hemoblogin were seen on repeated analysis over the course of 12 months.

COM-74-50189-04-06/GA
(Order as COM-74-50189-04)
Pennsylvania Univ., Philadelphia. Dept. of Clinical Studies.
SOME COAGULATION FACTORS IN PLASMA FROM A CALIFORNIA GRAY WHALE, 'ESCHRICHTIUS ROBUSTUS',
W. Medway. 1974, 3p NOAA-74050601-6, MFR-Paper-1050
Included in Marine Fisheries Review, v36 n4 p24-25 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Blood coagulation, Aquatic animals, Cetacea, Blood plasma.
Identifiers: *California gray whales, Exchrichtius robustus, Marine mammals.

A citrated plasma sample was assayed for some coagulation factors. The levels obtained were compared with those from some of the small toothed whales. Factor XII activity was very low in the gray whale sample, whereas toothed whales have none.

COM-74-50189-04-07/GA
(Order as COM-74-50189-04)
California Univ., Los Angeles. Dept. of Biology.
FLUORESCENT KARYOTYPE OF THE CALIFORNIA GRAY WHALE,
Deborah A. Duffield. 1974, 5p NOAA-74050601-7, MFR-Paper-1051
Included in Marine Fisheries Review, v36 n4 p25-28 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Chromosomes, *Genetics, Aquatic animals, Cetacea, Fluorescence.
Identifiers: California gray whales, Eschrichtius robustus, Marine mammals.

The fluroescent karyotype of the California gray whale, Eschrichtius robustus, is presented and the use of the fluorescent banding technique for distinguishing between various cetacean karyotypes is discussed.

COM-74-50189-04-08/GA
(Order as COM-74-50189-04)
Naval Undersea Center, San Diego, Calif.
SOME PHYSIOLOGICAL PARAMETERS OF THE BLOOD OF THE CALIFORNIA GRAY WHALE,
William G. Gilmartin, Richard W. Pierce, and George A. Antonelis, Jr. 1974, 5p NOAA-74050601-8, MFR-Paper-1052
Included in Marine Fisheries Review, v36 n4 p28-31 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Blood, *Animal physiology, Cetacea, Aquatic animals, Blood volume.
Identifiers: *California gray whales, Eschrichtius robustus, Marine mammals.

Hematocrit, a O2-Hb dissociation curve, and blood volume have been determined for a California gray whale, Eschrichtius robustus, and the results are compared to some physiological blood properties of other cetaceans. The E. robustus has a blood volume that is similar to values estimated for large whales by other authors. This is the first time isotopic techniques have been used to determine a large cetacean's blood volume. Large cetaceans do not appear to follow the trend of most terresterial mammals when the body size and P50 are compared. The P50 for the E. robustus was 36.5 mm Hg and is the highest reported for any cetacean.

COM-74-50189-04-09/GA
(Order as COM-74-50189-04)
Johns Hopkins Univ., Baltimore, Md.
FEEDING OF A CAPTIVE GRAY WHALE, 'ESCHRICHTIUS ROBUSTUS',
G. Carleton Ray, and William E. Schevill. 1974, 9p NOAA-74050601-9, MFR-Paper-1053
Contract N00014-67-A-0163-0010
Prepared in cooperation with Harvard Univ., Cmbridge, Mass. Museum of Comparative Zoology and Woods Hole Oceanographic Institution, Mass. under Contract N00014-66-C-0241. Rept. no. WHOI-Contrib-3069.
Included in Marine Fisheries Review, v36 n4 p31-38 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Feeding habits, Cetacea, Aquatic animals, Animal behavior.
Identifiers: *California gray whales, Marine mammals, Eschrichtius robustus.

The feeding of a captive yearling female Eschrichtius robustus was observed while diving with her as well as from the surface. She sucked food off the bottom while swimming tipped over about 120 degrees so that her cheek was nearly parallel to the bottom. An increase in mouth volume is apparently caused by action of the tongue, resulting in strong suction, during which the lower lip is opened and food enters the mouth. How food is separated from water and mud or detritus is not known. The observed behavior is probably natural and illuminates earlier records of stomach contents, external markings, and asymmetrical balleen. Clearly, much needs to be learned about the mechanism of feeding of baleen whales. This species' feeding habits may be unique among them.

COM-74-50189-04-10/GA
(Order as COM-74-50189-04)
Naval Undersea Center, San Diego, Calif.
SOUNDS PRODUCED BY THE GRAY WHALE, 'ESCHRICHTIUS ROBUSTUS',
James F. Fish, James L. Sumich, and George L. Lingle. 1974, 9p NOAA-74050601-10, MFR-Paper-1054
Included in Marine Fisheries Review, v36 n4 p38-45 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Marine biological noise, *Underwater acoustics, Aquatic animals, Cetacea, Animal behavior.
Identifiers: *California sea whales, Marine mammals, Eschrichtius robustus.

Underwater sounds produced by a young captive gray whale are described. A 'metallic-sounding pulsed signal,' consisting of 8 to 14 pulses in bursts lasting up to two sec was the most common vocalization. Other sounds included a low-frequency 'growl' or 'moan', similar to a sound recorded from gray whales at sea; a short, broadband, 'gruntlike' sound; a low-pitched 'blowhole rumble'; and a long 'metallic-sounding pulse train' that merged into a low-frequency 'groan'. The sounds could not be correlated with specific behaviors. Also described are 'clicks' recorded in the presence of the whale when she was returned to sea and similar 'clicks' recorded from gray whales in Wickaninnish Bay, Vancouver Island, Canada.

COM-74-50189-04-11/GA
(Order as COM-74-50189-04)
Naval Undersea Center, San Diego, Calif.
AERIAL OBSERVATIONS OF MIGRATING GRAY WHALES, 'ESCHRICHTIUS ROBUSTUS', OFF SOUTHERN CALIFORNIA, 1969-72,
J. S. Leatherwood. 1974, 6p NOAA-74050601-11, MFR-Paper-1055
Included in Marine Fisheries Review, v36 n4 p45-49 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Animal migrations, Aquatic animals, Cetacea, Populations.
Identifiers: *California gray whales, Eschrichtius robustus, Marine mammals.

Migrating gray whales were observed from helicopter and fixed-wing aircraft from central California south to Cedros and Guadalupe Islands, Baja California, Mexico, with the primary sighting effort off southern California. Peak numbers were observed off southern California in January for the southward migration and in March for the northward migration. Individuals were observed with the same relative frequency 80-160 km offshore as they were within 80 km of shore. Cows with calves were seen from February through May, primarily inshore, and tended to be alone or with other cows with calves. Yearling whales were seen inshore from February through April and also tended to be solitary or with other yearlings. Average speed of movement for northward migrants was 2.8 km/hour. (Modified author abstract)

COM-74-50189-04-12/GA
(Order as COM-74-50189-04)
Naval Undersea Center, San Diego, Calif.
A NOTE ON GRAY WHALE BEHAVIORAL INTERACTIONS WITH OTHER MARINE MAMMALS,
J. S. Leatherwood. 1974, 3p NOAA-74050601-12, MFR-Paper-1056
Included in Marine Fisheries Review, v36 n4 p50-51 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Animals behavior, Aquatic animals, Cetacea.
Identifiers: *California gray whales, Marine mammals, Exchrichtius robustus.

A few incidents of behavioral interactions between the California gray whale and other marine mammals are described. In one incident whales were observed from a helicopter for nearly 45 minutes and dolphins and porpoises were observed riding the pressure waves of the whales for the entire time. In addition, the gray whales were observed riding the large glassy swells which moved through the area. The gray whales appeared to be passive participants in the interaction.

COM-74-50189-04-13/GA
(Order as COM-74-50189-04)
National Marine Fisheries Service, Monterey, Calif. Pacific Environmental Group.
AERIAL OBSERVATIONS OF GRAY WHALES DURING 1973,
Paul N. Sund, and John L. O'Connor. 1974, 3p NOAA-74050601-13, MFR-Paper-1057
Included in Marine Fisheries Review, v36 n4 p51-52 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Animal migrations, Cetacea, Aquatic animals, Feeding habits, Populations.
Identifiers: *California gray whales, Marine mammals, Eschrichtius robustus.

The paper reports on simultaneous shore and aircraft observations of migrating gray whales and discusses the problems inherent in each method. It was found that resolution of numbers of whales in groups is more rapid and apparently more accurate from the air than from shore. Feeding behavior was observed on two occasions. A calf was seen accompanied by an adult.

COM-74-50189-04-14/GA
(Order as COM-74-50189-04)
Naval Undersea Center, San Diego, Calif.
TELEMETERING OF TEMPERATURE AND DEPTH DATA FROM A FREE RANGING YEARLING CALIFORNIA GRAY WHALE, 'ESCHRICHTIUS ROBUSTUS',
W. E. Evans. 1974, 8p NOAA-74050601-14, MFR-Paper-1058
Included in Marine Fisheries Review, v36 n4 p52-58 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Biotelemetry, Animal behavior, Cetacea, Aquatic animals, Diving, Radio transmitters, Environments, Data.
Identifiers: *California sea whales, Marine mammals, Eschrichtius robustus.

In 1968 the author initiated a series of studies using radio transmitters to follow the movements and study the diving behavior of small toothed whales.

This paper describes the modifications of this equipment necessary to use this technique on larger whales, in this case a yearling California gray whale, Eschrichtius robustus. In addition to the transmission of positional data, i.e. azimuth and depth of dive, the instrumentation package used in this study was designed to transmit environmental data (temperature-at-depth). (Modified author abstract)

COM-74-50189-84-15/GA
(Order as COM-74-50189-04)
California Univ., Santa Cruz. Coastal Marine Lab.
CAPTURE AND HARNESSING OF YOUNG CALIFORNIA GRAY WHALES, 'ESCHRICHTIUS ROBUSTUS',
Kenneth S. Norris, and Roger L. Gentry. 1974, 8p
NOAA-74050601-15, MFR-Paper-1059
Included in Marine Fisheries Review, v36 n4 p58-64 Apr 74, COM-74-50189-04.

Descriptors: *Whales, *Biotelemetry, *Animal migrations, Aquatic animals, Cetacea, Animal behavior, Data acquisition, Radio transmitters.
Identifiers: *California sea whales, Marine mammals, Eschrichtius rabustus.

The paper reports on the details of capture, harnessing, tracking, and harness release for three suckling gray whales. These tests are the first steps in a program to develop new means of data acquisition and recovery from whales during their migrations. It is hoped by these means to develop new information about population routes and hence population numbers to assist management. Capture was by tail noosing and head netting from a fishing vessel equipped with a swordfish plank. The harness, placed on the captive ashore, was held in place over the pectoral fins and back by means of a pair of metal plates held together by a soluble magnesium bolt. Tracking was by radio.

E74-10534 PC$4.00/MF$1.45
National Aeronautics and Space Administration, Bay Saint Louis, Miss. Earth Resources Lab.
APPLICATION OF REMOTE SENSING FOR FISHERY RESOURCE ASSESSMENT AND MONITORING.
Monthly progress rept. no. 12, 10 Apr-10 May 74,
Kenneth J. Savastano. 10 May 74, 3p NASA-CR-138283
Contract NASA Order-T-8217-B

Descriptors: Fishes, Ocean current, Ocean models, Marine biology, Oceanographic parameters, EREP, Skylab program, Photointerpretation, Dolphins.

The author has identified the following significant results. A plot was drawn of the dolphin catch and the water discontinuities observed in the aerial photography. This plot was similar in format to the one made earlier on the white marlin catch relative to the water rips. Neither plot substantiates (as far as white marlin and dolphin are concerned) an opinion held by fishermen that better fishing may be found in the vicinity of the rips. Remotely inferred values for sea surface temperature, chlorophyll-a and turbidity were substituted for sea truth measurements in prediction models developed in previous analysis. Model performance, using the new values, was disappointing.

TT-67-59075 PC$7.50/MF$1.45
Smithsonian Institution, Washington, D.C.
DEEP WATER ISOPODS (CRUSTACEA. ISOPODA) OF THE NORTH-WESTERN PART OF THE PACIFIC OCEAN,
Ya. A. Birstein. 1973, 327p
Trans. of mono. Glubokovodnye Ravnonogie Rakoobraznye Severo-Zapadnoi Chasti Tikhogo Okeana, Moscow, 1973. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Crustacea, *Pacific Ocean, Deep water, Classifications, Distribution(Property), Morphology, Feeding habits, Reproduction(Biology), Parasites, Translations, USSR.
Identifiers: Isopoda.

Contents:
Systematic list of the species discovered;
Classification;
Vertical distribution;
Morphological peculiarities of deep-water Isopoda;
Deep-water gigantism;
Feeding;
Reproduction;
Epiphytes and parasites;
Zoogeography;
Some problems of origin and evolution of deep-water Isopoda.

8B. Cartography

PB-232 451/5GA PC$3.75/MF$1.45
Geological Survey, Reston, Va. Topographic Div.
RESEARCH AND DEVELOPMENT IN TOPOGRAPHIC MAPPING.
Open-file rept.
Apr 74, 73p USGS-TD-74-001

Descriptors: *Mapping, *Topography, Topographic surveys, Photogrammetry, Stereomapping, Stereoscopic map plotters, Computers, Computer programs, Triangulation, Automatic mapping, Spaceborne photography, Land use.
Identifiers: Analytic aerial triangulation.

The annual report, covering the 12-month period ending in April 1974, summarizes the research and development activities of the U.S. Geological Survey, Topographic Division in the Office of Research and Technical Standards and in the Region offices at Arlington, Va., Rolla, Mo., Denver, Colo., and Menlo Park, Calif. The R and D projects mentioned concern the fields of cartography, field surveys, photogrammetry, orthophotomapping, and space technology. Articles by Division personnel prepared for presentation at meetings and conferences or for publication in professional journals and the Manual of Topographic Instructions are also listed.

8C. Dynamic Oceanography

AD-779 821/8GA PC$3.00/MF$1.45
Naval Weapons Lab Dahlgren Va
CROSS TRACK VERTICAL DEFLECTION ACCURACY OF A DUAL SATELLITE ALTIMETRY SYSTEM.
Technical rept.,
Cary Chen. Mar 74, 21p Rept no. NWL-TR-3117

Descriptors: *Ocean surface, *Sea states, *Radio altimeters, Satellites(Artificial), Gravity, Measurement, Deflection, Accuracy, Computerized simulation.

Cross track vertical deflection uncertainty of sea surface from a dual satellite radar altimeter system is investigated in this study. The representative case simulated for study is 1000 km height satellites in nearly circular polar orbits. The along track separation of the two satellites is approximately 300 km which corresponds to a cross track radar coverage of 10 minutes of arc. Using gravity field perturbation alone, it is found 2 sec relative error of deflection of vertical as most optimistic while 4 sec represents a more realistic error. The 2 sec relative error of deflection of vertical agrees well with a similar simulation study done by the Applied Physics Laboratory, Johns Hopkins University. (Author)

AD-779 873/9GA PC$4.00/MF$1.45
Rhode Island Univ Kingston Graduate School of Oceanography
FORTRAN PROGRAMS FOR AVERAGING, FILTERING, PLOTTING AND SPECTRAL ANALYSIS OF CURRENT METER OBSERVATIONS ON THE IBM 370/155.
Technical rept.,
William P. Kramer. Apr 74, 95p Rept no. Ref-74-1
Contract N00014-68-A-0215-0003

Descriptors: *Ocean currents, *Computer programs, Flowmeters, Oceanographic data, Data processing, FORTRAN, Spectrum analysis.
Identifiers: IBM 370/155 computers, RDPCHPLT computer program, MULTIPLT computer program, DATAMIX computer program, SMOOTH computer program, PROGVECT computer program, COMPPLOT computer program.

The FORTRAN Programs used for the processing of current meter analysis at the University of Rhode Island are described in detail. The programs are run on the IBM 370/155 computer. Remote access to this system is achieved via a Cope 1200 batch station on the Narragansett Bay Campus. Graphic output is done on a Broomall M-2000 drum plotter. These programs perform vector averaging, smoothing, spectral analysis and handle the graphic display of components and progressive vector diagrams. Data may be accessed on disk, tape or cards and may be in Cartesian or polar form. Sample output figures are included to show the relationship of input variables and output performance. (Author)

AD-779 931/5GA PC$4.00/MF$1.45
Informatics Inc Rockville Md
SOVIET MATERIAL ON INTERNAL WAVE EFFECTS.
Interim rept.,
Stuart G. Hibben. 30 Apr 74, 84p AFOSR-TR-74-0798
Contract F44620-72-C-0053, ARPA Order-1622
See also report dated 31 Jan 74, AD-776 067.

Descriptors: *Ocean waves, *Internal waves, *Bibliographies, USSR.

The report is a collection of abstracts of recent Soviet articles on generation and detection of internal waves. It is based mainly on items listed in the January 31, 1974 Bibliography of Soviet Material on Internal Waves which were indicated as being of potential interest. The abstracts are divided into internal effects, and surface effects comprising active and passive measurement of wave states. (Modified author abstract)

AD-780 070/9GA Reprint
Johns Hopkins Univ Baltimore Md Dept of Earth and Planetary Sciences
NONLINEAR DISPERSIVE WAVES.
Final rept.,
O. M. Phillips. 1974, 20p
Contract N00014-67-A-0163-0009
Availability: Pub. in Annual Review of Fluid Mechanics, v6 p93-110 1974.

Descriptors: *Ocean waves, Gravity waves, Internal waves, Dispersion relations, Surface waves.

A review of the interaction processes in dispersive waves with applications to capillary-gravity waves, internal waves and surface waves is presented.

AD-780 108/7GA PC$3.25/MF$1.45
Naval Ship Research and Development Center Bethesda Md
BUOY MOTION MEASUREMENT SYSTEM.
Evaluation rept.,
David T. Milne, Paul M. Haldeman, and Barry L. Zimmerman. Jun 73, 35p USCG-D-85-74

Descriptors: *Sea states, *Remote detectors, Buoys, Motion, Telemeter systems.

A buoy motion measurement system which measures, telemeters and records, on command, buoy

roll, pitch, heave and mooring cable tension is described. The system can accomodate up to seven buoys. The data is collected, conditioned and calibrated by equipment in the buoy and telemetered to the ground station where it is recorded on magnetic tape. Sea state information obtained from a wave height gauge at the ground station is recorded simultaneously. Data tapes are transported to a data analysis center where buoy motions are studied and compared.

COM-74-11083/4GA PC$4.00/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
BOTTOM DRIFT DUE TO PERIODIC WAVES,
Ellen R. Spielvogel, and Lester Q. Spielvogel. Dec 73, 13p HIG-73-19 NOAA-74050803, NOAA-JTRE-66

Descriptors: *Ocean waves, *Sediment transport, Shallow water, Mathematical models, Drift.
Identifiers: *Periodic waves, Solitary waves.

An analysis is presented as a method of predicting the transport of bottom particles such as sand, silt, and neutrally buoyant particles due to finite-amplitude shallow water waves. The nonlinear shallow water theory is used, retaining second order terms. There is a prediction of the transport of neutrally buoyant particles suspended in a fluid under the influence of periodic nonlinear surface waves. A comparison is made to existing theory which uses solitary waves or parts of solitary waves for the surface shape.

COM-74-11084/2GA PC$7.50/MF$1.45
Hawaii Inst. of Geophysics, Honolulu.
TSUNAMI PROPAGATION AND RESPONSE TO COASTAL AREAS,
Michael H. T. Chen. Dec 73, 86p HIG-73-15 NOAA-74050802, NOAA-JTRE-95

Descriptors: *Tsunamis, *Coasts, *Computerized simulation, Coastal engineering, Shore protection, Earthquakes, Finite difference theory, Wave equations.
Identifiers: Alaska earthquake(1964).

Expressing the governing equations of the linearized long-wave theory by an alternate-direction explicit scheme, a numerical model is developed to study tsunami propagation across an ocean. The model is first used to solve the time-harmonic steady-state problem such as a periodic long wave impinging upon a circular island with uniform water depth. Good agreement is found between the predicted and analytic solutions of the wave amplitude at the shoreline of the island. The destructive tsunami that resulted from the 1964 Alaska earthquake is simulated by a numerical code in spherical coordinates. In general, the predicted first arrival time is approximately 30 minutes earlier than the recorded values. This discrepancy is due to the treatment for the shoaling area, which becomes critical when the spatial grid is 1 degree by 1 degree for the model. The wave build-up at Crescent City and Hilo was due to local amplification and each should be examined separately. The predicted wave behavior for the selected station tends to agree with the recorded results. (Modified author abstract)

COM-74-11110/5GA PC$5.00/MF$1.45
Georgia Marine Science Center, Savannah.
PATTERNS OF WATER FLOW AND SEDIMENT DISPERSION ADJACENT TO AN ERODING BARRIER ISLAND.
Technical rept.,
George F. Oertel. Jan 74, 38p TR-73-9 NOAA-74050705

Descriptors: *Sediment transport, *Ocean currents, *Tybee Island, Hydrography, Sands, Tides, Savannah River, Georgia.
Identifiers: Sea Grant program.

A study of hydrography and sediment transport adjacent to Tybee Island, Georgia illustrated the role of tidal currents and residual currents in producing sediment transport patterns. Adjacent to Tybee Island, onshore currents associated with the flooding tide appear to be important mechanisms of sediment transport toward the Savannah River entrance. In most cases the residual flow of water determines the net flow of sand, however, some inconsistencies were present adjacent to Tybee Island. At two stations, there was a net flow of water in one direction and a potential net transport of sediment in the opposite direction.

COM-74-11111/3GA PC$7.75/MF$1.45
Georgia Marine Science Center, Savannah.
PATTERNS OF SEDIMENT DISPERSION ON THE SHORELINE OF AN ERODING BARRIER ISLAND.
Technical rept.,
George F. Oertel. Jan 74, 91p TR-74-2 NOAA-74050704
Grant NOAA-043-158-6

Descriptors: *Sediment transport, *Ocean currents, *Beach erosion, *Tybee Island, Coasts, Seasonal variations, Patterns, Georgia.
Identifiers: Sea Grant Program.

A study of the sediment budget of the shoreline at Tybee Island illustrated some relationships between sediment transport patterns and patterns of erosion. Sediment eroded from the northeast portion of the Tybee shoreline accumulated at the beach adjacent to Ninth Street and at the beach along the northwest portion of the island. Most of the shoreline responded to seasonal changes in energy conditions. During the fall and winter the beaches lost sand. During the spring and summer, the beaches gained sand. Between Third Street and Fourteenth Street, the sediment losses during the fall and winter were generally completely compensated for during the spring and summer recovery period. North of Third Street and South of Fourteenth Street, the sediment recovered during the spring and summer was insufficient to balance the losses of the previous fall and winter.

COM-74-90018-82-83/GA
(Order as COM-74-90018-02)
National Weather Service Forecast Office, Washington, D.C.
THE TSUNAMI WARNING SYSTEM,
Mark G. Spaeth. Mar 74, 5p NOAA-74042903-3
Included in Mariners Weather Log, v18 n2 p86-89 Mar 74.

Descriptors: *Tsunamis, *Warning systems, Alaska, Hilo Harbor, Hawaii, Earthquake.
Identifiers: Valdez(Alaska), Seward(Alaska).

The Tsunami Warning System is an amalgam of organizations, governmental and private, foreign and domestic, all operating at a high degree of readiness, to detect the infrequent tsunamis which cause death and destruction across the Pacific. The operation of the system begins with the detection of major earthquakes by the cooperating seismograph stations, scattered from La Plata, Argentina, to Hong Kong and from Wellington, New Zealand, to Indian Mountain, Alaska. Data are transmitted over the fastest available circuits to Honolulu, where the location of the earthquake and its magnitude are determined. If the earthquake is large enough and in an area where tsunami generation is possible, Honolulu Observatory requests the participating tide stations closest to the epicenter of the earthquake to examine their records for indications that a tsunami has been generated. If one has, Honolulu Observatory issues a warning to the various governmental organizations which are responsible for relaying the warnings to the population in the endangered areas. Tsunami research in NOAA is performed by the Joint Tsunami Research Effort of the Environmental Research Laboratories and the University of Hawaii. Primary research is aimed at providing wave height forecasts for tsunamis.

PB-232 660/1GA PC$6.00/MF$1.45
Texas Univ., Austin.
ESTABLISHMENT OF OPERATIONAL GUIDELINES FOR TEXAS COASTAL ZONE MANAGEMENT: INTERIM REPORT ON ESTUARINE MODELING,
George W. Murfee, E. Gus Fruh, and Frank D. Masch, Jr. May 73, 56p NSF-RA/E-73-021
Grant NSF-GI-34870

Descriptors: *Estuaries, *Water pollution, *Corpus Christi Bay, Coastal zone management, Mathematical models, Tides, Hydrodynamics, Salinity, Wind velocity, Evaporation, Spatial distribution, Biochemical oxygen demand, Nitrogen organic compounds, Dissolved gases, Oxygen, Phosphorus organic compounds, Texas.

The estuarine modeling effort for this study has concentrated on the application of tidal hydrodynamic and water quality transport models to Corpus Christi Bay, Texas. The initial simulation work used existing hydrodynamic and salinity transport models of a system which included not only Corpus Christi but also Aransas to Copano Bays. Sensitivity tests were performed. In the hydrodynamic model, the response of tidal amplitudes and flows were determined for changes in roughness, wind stress coefficients, and evaporation rate. Water quality transport models which simulate the spatial distribution of Biochemical oxygen demand; dissolved oxygen; total phosphorus; organic, ammonia, nitrite, and nitrate nitrogen are also under development.

8D. Geochemistry

PB-232 690/8GA MF$1.45
National Committe for Geochemistry, Washington, D.C.
ORIENTATIONS IN GEOCHEMISTRY.
Jan 74, 139p* ISBN-0-309-02147-2
Contract NSF-C310
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. $5.75.

Descriptors: *Geochemistry, *Books, Intergalactic medium, Lunar crust, Earth, Organic compounds, Ecology, Oceanography.

An effort is made to provide a useful description of the growing field of geochemistry, its scope and potential. The report presents an assessment of current work in geochemistry, analyzes its interrelationships with the other earth and planetary sciences, and suggests directions for progress in the field during the next 5 to 10 years. Discussions center areound the four major subject areas of extraterrestrial geochemistry, solid earth geochemistry, exogenic or low-temperature aqueous chemistry, and organic geochemistry. The report also discusses the interrelations of geochemistry and environmental concerns, and the role of geochemistry in understanding the origin of natural resources and contributing to their development. Brief section on experimental techniques and facilities and on data and sample accessibility complete the report.

8E. Geodesy

AD-779 843/2GA PC$7.50/MF$1.45
Defense Mapping Agency Aerospace Center St Louis Air Force Station Mo Technical Translation Section
STUDY OF SOME PROBLEMS OF TRANSFORMATION OF POTENTIAL FIELDS,
M. A. Aleksidze, M. S. Gelashvili, and K. M. Kartvelishvili. Feb 74, 289p Rept no. DMAAC-TC-1987
Trans. of mono. Issledovanie Nekotorykh Voprosov Transformatsii Potentsialnykh, Tiflis, 1972 284p, by H. Tomas, and J. M. Willis.

Descriptors: *Geopotential, *Gravity, Field theory, Partial differential equations, Translations, USSR, Computations, Computer programs.

Identifiers: ALGOL 60 programming language.

The monograph gives a complete exposition of three methods of transforming potential fields, and in each case algorithms are presented for working them on general-purpose digital computers. For two of them the corresponding universal programs are also provided, one of which is written in M-220 machine code, and the other in the algorithmic language ALGOL-60.

AD-780 067/5GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
GRAVITY ANOMALIES ON THE CONTINENTAL MARGIN OF ANGOLA, AFRICA: REPLY,
Philip D. Rabinowitz. 14 Jan 74, 4p Rept no. LDGO-2055
Contract N00014-67-A-0108-0004, Grant NSF-GA-27281
Sponsored in part by Grant NSF-GA-17761. Revision of report dated 28 Sep 73.
Availability: Pub. in Jnl. of Geophysical Research, v79 n11 p1727-1728, 10 Apr 74.

Descriptors: *Gravity, *Continental shelves, *Angola, Subsharan Africa, Anomalies, Geophysical prospecting.
Identifiers: Gravity anomalies.

The short note is a reply to Nelson Steenland on 'Comments on gravity anomalies on the continental margin of Angola, Africa.'

AD-780 370/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
USING CLOUD AND TEMPERATURE DATA TO SOLVE PROBLEMS OF RECONSTRUCTING METEOROLOGICAL ELEMENT FIELDS FROM THE DATA OF ARTIFICIAL EARTH SATELLITES,
Sh. A. Musaelyan. 24 May 74, 12p Rept no. FTD-HT-23-1115-74
Edited trans. of Gidrometeorologicheskii Nauchno-Issledovatelskii Tsentr SSSR. Trudy, n104 p73-78 1972, by Marilyn Olaechea.

Descriptors: *Geopotential, *Height finding, Meteorological satellites, Data processing, Correlation techniques, Translations, USSR.

The article concerns determining the geopotential field from data on vertical velocities and temperatures.

E74-10533 PC$4.25/MF$1.45
Battelle Columbus Labs., Ohio.
CALIBRATION AND EVALUATION OF SKYLAB ALTIMETRY FOR GEODETIC DETERMINATION OF THE GEOID.
Progress rept. no. 14, 1-30 Apr 74,
A. G. Mourad, and D. M. J. Fubara. 16 May 74, 21p NASA-CR-138282
Contract NAS9-13276

Descriptors: Geoids, Geodetic surveys, Oribital element, Oceanography, EREP, Skylab program, Data processing, Mapping.

The author has identified the following significant results. An analytical method for geodetic computation of the marine geoid (the geoid in the oceans) from satellite altimetry is developed and validated with data from Skylab mission SL-2. The criteria for achieving accurate scale and orientation of satellite altimetry geoid are shown to require marine geodetic control to offset systematic errors in the orbit (orientation is completely orbit dependent) and the altimeter data.

PB-232 728/6GA PC$8.75/MF$1.45
Geological Survey, Menlo Park, Calif.
PRINCIPAL FACTS, ACCURACIES, AND SOURCES FOR 3046 GRAVITY STATIONS ON THE SAN JOSE 1 DEGREE X 2 DEGREE QUADRANGLE, CALIFORNIA.
Final rept.,
S. L. Robbins, H. W. Oliver, K. D. Holden, and R. C. Farewell. 1972, 112p USGS-GD-74-019

Descriptors: *Gravity, *California, Observed gravity, Gravity anomalies, Gravimetric geodesy, Statistical data, Printouts.
Identifiers: San Jose(California).

Principal facts for 3046 gravity stations on the San Jose one degree x 2 degrees quadrangle, California are given in 21 separate tables. Also included in the report is a description of the format and reduction processes used, station name and location plots at a scale of 1:250,000, and descriptions for 13 prime and 1st-order base stations. All the gravity stations have been reduced to complete Bouguer anomalies. A discussion of individual data sets is provided and includes information pertaining to data sources, gravity meters used, calibration of meters, base stations used, reduction problems and overall accuracies of the data. In adjusting specific sets of data to one datum and one format, datum differences as great as 8.5 milligals and calibration tilts as large as two percent were found. The data for each gravity station contain alphanumeric digits that indicate type of station location relative to elevation determination, accuracy of station elevation, accuracy of latitude or horizontal location and determination, and accuracy of the station's observed gravity value relative to its local base station. A table providing the code for these digits is also included.

8F. Geography

E74-10494 PC$10.50/MF$1.45
National Physical Research Lab., Pretoria (South Africa).
TO ASSESS THE VALUE OF SATELLITE IMAGERY IN RESOURCE EVALUATION ON A NATIONAL SCALE.
Final rept. Jul 72-Nov 73,
O. G. Malan. Nov 73, 149p NASA-CR-136898, CSIR-SR-FIS-50
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: South Africa, Resources management, Vegetation, Land use, Geology, Mapping, Earth resources program, Tectonics, Geomorphology, Ecology.

The author has identified the following significant results. It has been shown that ERTS imagery, particularly in the form of 1:500,000 scale false color photolithographic prints, can contribute very significantly towards facilitating and accelerating (dramatically, in the case of vegetation) resource surveys and geologic mapping. Fire mapping on a national scale becomes a feasibility, numerous new geologic features, particularly lineaments, have been discovered, land use can be mapped efficiently on a regional scale and degraded areas identified. The first detailed tectonic and geomorphological maps of the Republic of South Africa will be published in the near future mainly owing to the availability of ERTS-1 imagery.

E74-10536 PC$5.00/MF$1.45
Botswana Geological Survey, Lobatsi.
TO ASSESS THE VALUE OF SATELLITE PHOTOGRAPHS IN RESOURCE EVALUATION ON A NATIONAL SCALE.
Final rept. Sep 72-Apr 74,
J. V. Hepworth, and S. M. Hutton. 26 Apr 74, 39p NASA-CR-138285

Descriptors: Satellite-borne photography, Photointerpetation, Mapping, Botswana, Earth Resources program, Imaging techniques, Multispectral band scanners, Multispectral photography.

The author has identified the following significant results. The limit of resolution on ERTS imagery is normally acknowledged to be about 60 miles although very long features such as roads and railways which are often less than 10 miles long are easily detectable. An example is the north-south road and railway from Lobatse to Francistown. Vegetation growth from winter to summer is readily monitored on false color imagery. The limits of government ranches and special farming areas can be quite accurately ascertained from ERTS imagery. Another aspect to which ERTS imagery lends itself is the location and demarcation of bush fires, many of which were seen on the first imagery which was acquired at the end of the cold, dry season. As a whole, MSS 7 offers maximum reflectance contrast among black and white imagery and is the wavelength used most for interpretation.

PB-232 649/4GA PC$4.00/MF$1.45
Earth Satellite Corp., Washington, D.C.
REPORT OF THE ERS SATELLITE COST BENEFIT STUDY.
Quarterly rept. no. 4, Nov 73-Jan 74.
22 Feb 74, 96p USGS-DO-74-007
Contract DI-14-08-0001-13519
See also PB-226 777.

Descriptors: *Environmental surveys, *Natural resources, *Scientific satellites, *Benefit cost analysis, Remote sensing, Land use, Forestry, Agriculture, Management planning.
Identifiers: ERTS-1 satellite.

During the fourth quarter work on case studies continued. Studies in rangeland and water resources management were completed. Others on land use planning and environmental management continued. Recommendations were made for case studies in forestry management to evaluate benefits from timber inventory, assessment and control of destructive agents and fire damage, and estimation of forest vigor; and in environment monitoring to evaluate status of strip mining and reclamation, condition of wetlands, and regional water quality. Technical notes on definition of the environmental monitoring case study, and evaluation of case study potential in marine resource management are presented.

8G. Geology and Mineralogy

AD-779 868/9GA PC$3.25/MF$1.45
Naval Underwater Systems Center New London Conn New London Lab
SINGLE-FREQUENCY MAGNETOTELLURIC TENSOR IMPEDANCE MEASUREMENTS IN THE UPPER PENINSULA, MICHIGAN.
Technical rept.,
Robert A. Sainati, and J. Robert Katan. 6 May 74, 41p Rept no. NUSC-TR-4699

Descriptors: *Geological survey, *Telluric currents, *Michigan, Electrical impedance, Tensors, Computer programs, Global communication systems, Extremely low frequency, Radio transmitters.
Identifiers: Telluric current exploration, Sanguine project.

Single-frequency magnetotelluric (MT) resistivity measurements were made of tensor impedance at several sites in the Upper Peninsula, Michigan. This report describes the manner in which the resultant data may be interpreted. It is shown that the measured data were in good agreement with the known geology of the region and agreed reasonably well with conductivity values calculated using the wave impedance method. (Author)

AD-780 037/8GA PC$3.75/MF$1.45
Terra Tek Inc Salt Lake City Utah
MECHANICAL PROPERTIES OF TWO HIGHLY POROUS GEOLOGIC MATERIALS.
Final rept. Apr 72-Apr 73,
F. H. Shipman, J. N. Johnson, and S. J. Green. Apr 74, 65p Rept no. TR-73-45 AMMRC-CTR-74-25

Contract DAAG46-72-C-0169

Descriptors: *Sandstone, *Rock mechanics, Loads(Forces), Hydrostatic pressure, Compression, Strain(Mechanics), Stresses, Shear strength, Colorado.
Identifiers: Tuff, Nevada Test Site, Mixed Company Site.

Hydrostatic pressure, compression under different confining pressures, proportional loading and uniaxial-strain tests were conducted on a dry tuff from the Nevada Test Site and dry Kayenta sandstone from the Mixed Company Site near Grand Junction, Colorado. Both rocks exhibit behavior which is characteristic of very porous geological materials; namely, increasing shear strength as a function of confining pressure, large volume compaction followed by volume dilatancy under selected loadings with enhanced compaction, over some pressure ranges, in the presence of shear deformation. Both materials also exhibit strain work-hardening. A 'cap model' is applied to represent the mechanical behavior of these two materials. This model accounts for all of the aforementioned characteristics of both the tuff and the sandstone, and provides a means to represent the path dependence of their mechanical properties. (Author)

AD-780 066/7GA Reprint
Lamont-Doherty Geological Observatory Palisades N Y
HEAT FLOW ANOMALY ASSOCIATED WITH DIKE INTRUSION, 1,
Ki-Iti Horai. 20 Nov 73, 9p Rept no. LDGO-2054
Contract N00014-67-A-0108-0004, Grant NGR-33-008-174
Sponsored in part by Grant NSF-GA-27281. Revision of report dated 30 May 73.
Availability: Pub. in Jnl. of Geophysical Research, v79 n11 p1640-1646, 10 Apr 74.

Descriptors: *Earth crust, Heat transmission, Anomalies, Conformal mapping, Integral transforms.
Identifiers: Magma, Intrusive rocks.

Disturbances in a temperature field in the earth's crust due to dike intrusion were studied. The earth's crust was assumed to be a two-dimensional, isotropic, homogeneous, semi-infinite medium with constant thermal conductivity and zero surface temperature. The dike was approximated by an isotherm of rectangular shape having temperature T(0) and width 2B and extended vertically from depth H to depth D. The steady state temperature field in this medium was studied by conformal mapping. (Modified author abstract)

AD-780 083/2GA PC$3.00/MF$1.45
Army Electronics Command Fort Monmouth N J
VISIBLE AND NEAR-INFRARED ABSORPTION COEFFICIENTS OF MONTMORILLONITE AND RELATED CLAYS.
Research and development technical rept.,
James B. Gillespie, James D. Lindberg, and Michael S. Smith. May 74, 17p Rept no. ECOM-5539

Descriptors: *Clay, *Visible spectra, *Infrared spectra, *Aerosols, Near infrared radiation, Montmorillonite.
Identifiers: Atmospheric attenuation.

Estimates of the optical absorption coefficients for montmorillonite, hectorite, nontronite, metabentonite, illite, and attapulgite clay minerals were made by the application of diffuse reflectance spectroscopy in the spectral region from 0.4 to 2.4 micrometers. These clay minerals are weak absorbers over this spectral range, with the primary absorption occurring in the 1.4-micrometers and 1.9-micrometer water bands. Values of the absorption coefficients were on the order of 10 to 20/cm in the 1.4-micrometer band and 20 to 30/cm in the 1.9-micrometer band with the exception of the metabentonite, which gave an absorption coefficient of about 80/cm in the 1.9-micrometer band. The absorption coefficient increased rapidly as the near-ultraviolet region was approached. (Modified author abstract)

AD-780 248/1GA PC$5.50/MF$1.45
Edaw Inc San Francisco Calif
ANALYSIS METHODOLOGY OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 47p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 249.

Descriptors: *Geological survey, *Texas, Site selection, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project, Environmental surveys.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 249/9GA PC$5.25/MF$1.45
Edaw Inc San Francisco Calif
BEDROCK GEOLOGIC DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 42p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 250.

Descriptors: *Geological survey, *Texas, Statistical data, Maps, Site selection, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 258/0GA PC$7.50/MF$1.45
Edaw Inc San Francisco Calif
MINERAL EXTRACTION DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 89p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 259.

Descriptors: *Geological survey, *Minerals, *Michigan, Mines(Excavations), Maps, Tables(Data), Site selection, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the foolowing Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 262/2GA PC$4.75/MF$1.45
Edaw Inc San Francisco Calif
SURFACE GEOLOGIC DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 31p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 263.

Descriptors: *Geological survey, *Michigan, Maps, Site selection, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 280/4GA PC$4.00/MF$1.45
Edaw Inc San Francisco Calif
SURFICIAL GEOLOGIC DATA ON THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 18p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 281.

Descriptors: *Geological survey, *Texas, Maps, Site selection, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 283/8GA PC$4.50/MF$1.45
Edaw Inc San Francisco Calif
INTRODUCTION TO PHASE I OF THE SITE STUDY FOR THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 30p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 284.

Descriptors: *Geological survey, *Texas, Site selection, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project, Environmental surveys.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 285/3GA PC$5.00/MF$1.45
Edaw Inc San Francisco Calif
BEDROCK GEOLOGIC DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 37p

Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 286.

Descriptors: *Geological survey, *Michigan, Statistical data, Maps, Site selection, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 294/5GA PC$4.25/MF$1.45
Edaw Inc San Francisco Calif
INTRODUCTION TO PHASE I OF THE SITE STUDY FOR THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 25p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 248.

Descriptors: *Geological survey, *Michigan, Site selection, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project, Environmental surveys.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

COM-74-11097/4GA PC$5.25/MF$1.45
North Carolina State Univ., Raleigh.
RELICT SEDIMENT DEPOSITS IN A MAJOR TRANSGRESSIVE COASTAL SYSTEM.
Sea Grant pub.,
S. R. Riggs, and M. P. O'Connor. Jan 74, 44p
UNC-SG-74-04 NOAA-74051405
Grant NOAA-043-158-40
Prepared by East Carolina Univ., Greenville, N.C. Dept. of Geology.

Descriptors: *Coastal topographic features, *Erosion, *Sedimentation, Roanoke Island, North Carolina, Florida, Estuaries, Sediments, Mexico Gulf.
Identifiers: Sea Grant program, Indian Rocks(Florida).

Relict sediments occur both on the continental shelf and within estuaries as a result of intra-estuarine erosion. It is possible that continued transgression of a barrier system could re-expose several types of estuarine sediments on the shelf areas which could produce extremely complex facies relationships. The objectives of this paper are (1) to examine the occurrence, mode of formation, and geometry of the modern and relict sediments within a major estuary and to identify possible sediment characteristics and trends which could be useful in recognizing relict sediments on the shelf, and (2) to consider a possible relict origin for some of the nearshore shelf features exposed seaward of a transgressing barrier system. The conclusions reached in this paper are based upon detailed sediment studies in the barrier island coastal systems of North Carolina and the Gulf Coast area of Central Florida.

COM-74-11115/4GA PC$6.50/MF$1.45
Wisconsin Univ., Madison. Sea Grant Program.
MAGNETIC AND SEISMIC REFLECTION SURVEYS OF LAKE SUPERIOR.
Technical rept.,
Carl Peter Brzozowy. Mar 74, 69p WIS-SG-74-220
NOAA-74051601
Master's thesis.

Descriptors: *Lake Superior, *Magnetic surveys, *Seismic surveys, *Geophysical prospecting, Copper, Seismic reflection method, Geologic structures, Theses.
Identifiers: Sea Grant program.

The purpose of this survey was to study the structure of the area and to assess the potential of copper deposits in the waters surrounding the Keweenaw copper producing district. Approximately 1,000 track miles of data were gathered. The data consisted of continuous air gun seismic profiles, sono-buoy refraction profiles, continuous magnetometer profiles, high resolution profiles, and some 200 grab and dredge samples of the lake bottom. The lines along which the data were gathered and the limits of the study are illustrated. This paper is primarily concerned with the results of the air gun seismic and magnetic data and their relation to the structural framework of the study area and the Lake Superior region.

E74-10507 PC$5.00/MF$1.45
Colorado School of Mines, Golden. Dept. of Geology.
GEOLOGIC INFORMATION FROM SATELLITE IMAGES,
Keenan Lee, Daniel H. Knepper, and Don L. Sawatzky. 27 Mar 74, 39p Remote Sensing-74-3
NASA-CR-138230
Contracts NAS9-13394, NAS5-21778
Presented at the Remote Sensing of Earth Resources Conference (3rd) Tullahoma, Tenn., 26 Mar 1974. Supported in part by Grant NGL-06-011-015.
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Structural properties(Geology), Tectonics, Lithology, Photogeology, Multispectral photography, Rocky Mountains(North America), EREP, Skylab program, Earth resources program, Photointerpretation, Mineral exploration, Oil exploration.

The author has identified the following significant results. Extracting geologic information from ERTS and Skylab/EREP images is best done by a geologist trained in photointerpretation. The information is at a regional scale, and three basic types are available: rock and soil, geologic structures, and landforms. Discrimination between alluvium and sedimentary or crystalline bedrock, and between units in thick sedimentary sequences is best, primarily because of topographic expression and vegetation differences. Discrimination between crystalline rock types is poor. Folds and fractures are the best displayed geologic features. They are recognizable by topographic expression, drainage patterns, and rock or vegetation tonal patterns. Landforms are easily discriminated by their familiar shapes and patterns. It is possible to optimize the scale, format, spectral bands, conditions of acquisition, and sensor systems for best geologic interpretation. Several examples demonstrate the applicability of satellite images to tectonic analysis and petroleum and mineral exploration.

E74-10510 PC$5.00/MF$1.45
Colorado School of Mines, Golden. Dept. of Geology.
AN EVALUATION OF MULTIBAND PHOTOGRAPHY FOR ROCK DISCRIMINATION,
Keenan Lee, and Gary L. Raines. 27 Mar 74, 38p Remote Sensing-74-4 NASA-CR-138233
Grants NGL-06-001-015, DA-ARO(D)-31-124-71-G101
Presented at the Remote Sensing of Earth Resources Conference (3rd), Tullahoma, Tenn., 26 Mar. 1974. Supported in part by Grant DA-ARO-D-31-124-73-G88.

Descriptors: Multispectral photography, Colorado, Photogeology, Sedimentary rocks, Earth resources program, Spectral reflectance, Spectral bands, Photomapping.

The author has identified the following significant results. With the advent of ERTS and Skylab satellites, multiband imagery and photography have become readily available to geologists. The ability of multiband photography to discriminate sedimentary rocks was examined. More than 8600 in situ measurements of band reflectance of the sedimentary rocks of the Front Range, Colorado, were acquired. Statistical analysis of these measurements showed that: (1) measurements from one site can be used at another site 100 miles away; (2) there is basically only one spectral reflectance curve for these rocks, with constant amplitude differences between the curves; and (3) the natural variation is so large that at least 150 measurements per formation are required to select best filters. These conclusions are supported by subjective tests with aerial multiband photography. The designed multiband photography concept for rock discrimination is not a practical method of improving sedimentary rock discrimination capabilities.

LA-5540-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
SELECTED PHYSICOCHEMICAL PROPERTIES OF BASALTIC ROCKS, LIQUIDS, AND GLASSES.
M. C. Krupka. Mar 74, 11p
Contract W-7405-eng-36

Descriptors: (*Basalt, *Chemical properties), (*Glasses, Chemical properties), (*Lava, *Physical properties), Density, Rock drilling, Specific heat, Subterrene penetrators, Thermal conductivity, Thermal diffusivity, Thermal expansion, Viscosity.

For abstract, see NSA 29 12, number 29397.

PB-232 662/7GA MF$1.45
Geodynamics Committee, Washington, D.C.
U.S. PROGRAM FOR THE GEODYNAMICS PROJECT: SCOPE AND OBJECTIVES.
Nov 73, 238p* ISBN-O-309-02211-8
Paper copy available from National Academy of Sciences, Printing and Publishing Office, 2101 Constitution Ave., Washington, D.C. 20418 $3.25.

Descriptors: *Geodynamics, *Tectonics, Research projects, Research management, National government, Volcanoes, Geological faults, Continental drift.
Identifiers: Geodynamics project.

The Geodynamics Project spanning the year 1971-1979 is an international program and intensive effort to study the basic mechanism of earth deformation. Now the report is available for the benefit of all those involved in geoscience at any level. It sets forth the background of the Program, states why geodynamics studies are timely, reviews the objectives of the U.S. Program, describes the scientific scope of geodynamics problems, and suggests the kinds of research that should be pursued toward solution of these problems. The focus of the proposed U.S. Program is on the plate-tectonics model because its ability to explain and predict appears to be greater than any previous or alternative model.

PB-232 999/3GA PC$3.75/MF$1.45
Kentucky Water Resources Inst., Lexington.
LABORATORY SIMULATION OF RAINFALL EROSIVITY FOR GULLY FORMATION STUDY.
Research rept.,
T. Y. Kao. May 74, 67p RR-73 W74-08937,
OWRR-A-037-KY(1)

Contract DI-14-31-0001-3517, DI-14-31-0001-3817

Descriptors: *Rainfall, *Simulators, *Soil erosion, Laboratory equipment, Model studies, Gullies.

The objective was to develop a rainfall simulator, which imparts to the laboratory rainfall the more important characteristics of natural rainfall such as intensity, drop spectrum, kinetic energy, and momentum at impact, for using in soil erosion research with better results. In developing this simulator the better features of the basic types of earlier simulators, drip and nozzle, have been incorporated into this single design. The test results indicated that this simulator provides good simulation of the natural rainfall erosivity. (Modified author abstract)

8H. Hydrology and Limnology

AD-779 849/9GA PC$3.25/MF$1.45
Louisiana State Univ Baton Rouge Coastal Studies Inst
SALTWATER INTRUSION INTO A FLOWING STREAM.
Technical rept.,
William R. Waldrop, Richard C. Farmer, and Philip A. Bryant. May 74, 42p* Rept no. TR-161
Contract N00014-69-A-0211-0003

Descriptors: *Rivers, *Salt water, Mathematical models, Ocean tides, Two dimensional flow, Finite difference theory, Computer programs.
Identifiers: *Salt water intrusion, Bayou Lafourche.

A parametric study of the flow of saline water intrusions which are driven into rivers by tidal fluctuations was accomplished with a mathematical model. Specifically, the saltwater intrusion at the bottom of Bayou Lafourche was studied. Empirical eddy transport was used, and available field data served as boundary conditions. The finite-difference model describes unsteady flow variation in two spatial dimensions. The use of the third spatial dimension is not necessary to describe the physical phenomena governing the intrusion. (Author)

AD-780 254/9GA PC$5.25/MF$1.45
Edaw Inc San Francisco Calif
SURFACE WATER DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 45p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 255.

Descriptors: *Surface waters, *Water supplies, *Texas, Global communication systems, Extremely low frequency, Sites, Rivers, Drainage, Quality, Fluid flow, Tables(Data), Sediments.
Identifiers: *Sanguine project, Water quality, Stream flow, Bed load.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles westnorthwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 298/3GA PC$5.75/MF$1.45
Edaw Inc San Francisco Calif
SURFACE WATER DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 51p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 291.

Descriptors: *Surface waters, *Water supplies, *Michigan, Global communication systems, Extremely low frequency, Sites, Rivers, Drainage, Fluid flow, Quality, Lakes, Water pollution, Sediments, Tables(Data).
Identifiers: *Sanguine project, Water quality, Stream flow, Bed load.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

ANL-8078 PC$5.45/MF$1.45
Argonne National Lab., Ill. (Usa).
ENVIRONMENTAL MONITORING AT ARGONNE NATIONAL LABORATORY. ANNUAL REPORT, 1973.
J. Sedlet, N. W. Golchert, and T. L. Duffy. Mar 74, 88p
Contract W-31-109-eng-38

Descriptors: (*Anl, *Radioactivity), (*Illinois, Radioactivity), (*Surface air, *Radiation monitoring), (*Surface waters, Radiation monitoring), Alpha sources, Argon 41, Beta sources, Environment, Gamma radiation, Grass, Human populations, Milk, Nonradioactive wastes, Plants, Plutonium 238, Plutonium 239, Radiation doses, Radioactive wastes, Research reactors, Soils, Strontium 89, Strontium 90, Thorium 228, Thorium 230, Thorium 232, Tritium, Uranium, Water pollution.

For abstract, see NSA 29 12, number 29315.

BNWL-1754 PC$7.60/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
MODELS AND COMPUTER CODES FOR EVALUATING ENVIRONMENTAL RADIATION DOSES.
J. K. Soldat, N. M. Robinson, and D. A. Baker. Feb 74, 170p
Contract AT(45-1)-1830

Descriptors: (*Nuclear power plants, *Environment), (*Radiation doses, *Computer calculations), (*Human populations, Radiation doses), (*Radioactive wastes, *Radiation hazards), A codes, Animals, Aquatic ecosystems, Biological models, C codes, Computer codes, Diet, Diffusion, Food chains, G codes, Gaseous wastes, Internal irradiation, Liquid wastes, Man, Mathematical models, Organs, Radioactivity, Radionuclide kinetics, Radionuclide migration, Whole-body irradiation.

For abstract, see NSA 29 12, number 29346.

BNWL-1812 PC$5.45/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
CHARACTERIZATION OF ACTINIDE BEARING SOILS: TOP SIXTY CENTIMETERS OF 216-Z-9 ENCLOSED TRENCH.
L. L. Ames. Feb 74, 142p
Contract AT(45-1)-2130

Descriptors: (*Hapo, *Radioactive waste disposal), (*Soils, *Contamination), (*Plutonium oxides, *Quantitative chemical analysis), (*Plutonium, *Abundance), Diffusion, Drill cores, Underground disposal, X-ray radiography.

For abstract, see NSA 29 12, number 29340.

BNWL-1850(Pt.2) PC$7.60/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
PACIFIC NORTHWEST LABORATORY ANNUAL REPORT FOR 1973 TO THE USAEC DIVISION OF BIOMEDICAL AND ENVIRONMENTAL RESEARCH. PART 2. ECOLOGICAL SCIENCES.
B. E. Vaughan. Jan 74, 210p
Contract AT(45-1)-1830

Descriptors: (*Ecosystems, *Research programs), Leading abstract.

For abstract, see NSA 29 12, number 29366.

COM-74-10930-SET/GA Mag Tape $325.00;Foreign $405.00
National Weather Service, Silver Spring, Md. Office of Hydrology.
NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM, FORECAST PROCEDURES AND NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM, SNOW ACCUMULATION AND ABLATION MODEL,
Eric A. Anderson. Oct 73, 480p in 2v and 2 reels mag tape
Set includes COM-73-10298, COM-73-10365, COM-74-10728, and COM-74-10931.
Specify tape recording mode desired: 7 track, 556 BPI, even parity, BCD- or 9 track, 800 BPI, odd parity, EBCDIC.

Descriptors: *Streamflow, *Computer programs, Flood forecasting, Snowmelt, Snowfall, Atmospheric temperature, Precipitation(Meteorology), Evapotranspiration, FORTRAN, Magnetic tapes.
Identifiers: FORTRAN 4 programming language, CDC 6600 computers.

National Weather Service River Forecast System - Forecast Procedures consisting of eight FORTRAN 4 Source Computer Programs written for processing on a CDC-6600 computer, and nine data files. There are 12,360 records in these seventeen files. Five programs are used for data processing and data manipulation. Model calibration, historical hydrograph simulation and operational river flow forecasting programs are included. National Weather Service River Forecast System - Snow Accumulation and Ablation Model consists of five FORTRAN 4 source Computer Programs, two for model calibration (the verification and optimization programs) and three for computing mean areal air temperature there are also seven data files included in this system consisting of precipitation, potential evapotranspiration air temperature, and stream flow data. These programs are written for processing on a CDC 6600/Scope 3.3 Computer system.

COM-74-10931/5GA Mag Tape $175.00;Foreign $219.00
National Weather Service, Silver Spring, Md. Office of Hydrology.
NATIONAL WEATHER SERVICE RIVER FORECAST SYSTEM, SNOW ACCUMULATION AND ABLATION MODEL - PROGRAMS AND TEST DATA,
Eric A. Anderson. Oct 73, 1 reel mag tape
Specify tape recording mode desired: 7 track, 556 BPI, even parity, BCD- or 9 track, 800 BPI, odd parity EBCDIC. Price includes documentation, COM-74-10728. Also available from NTIS $325.00 (Foreign $405.00) in set of 2 magnetic tapes with documentation as COM-74-10930-SET.

Descriptors: *Streamflow, *Computer programs, Flood forecasting, Snowmelt, Snowfall, Atmospheric temperature, Precipitation(Meteorology), Evapotranspiration, Passumpsic River, FORTRAN, Magnetic tapes.
Identifiers: FORTRAN 4 programming language, CDC 6600 computer.

The magnetic tape contains computer programs and test data for the National Weather Service

River Forecast System, Snow Accumulation and Ablation model. The complete source deck of the two programs used for model calibration (the verification and optimization programs) are included. In addition, the tape contains snow subroutines for the operational river forecasting program and three programs to compute mean areal air temperature. The test data are for the Passumpsic River at Passumpsic, Vermont. Precipitation, potential evapotranspiration, air temperature, and streamflow data are included. The programs are written in FORTRAN IV extended for use on CDC 6600/SCOPE 3.3 computer system. There are 12 files comprised of 11342 card images (records) on the magnetic tape.

COM-74-11085/9GA Reprint(PC$4.00)
State Univ. of New York, Buffalo. Dept. of Biology.
WINTER CONDITIONS IN LAKE ERIE WITH REFERENCE TO ICE AND THERMAL STRUCTURE AND COMPARISON TO LAKES WINNEBAGO (WISCONSIN) AND MILLE LACS (MINNESOTA),
Kenton M. Stewart. 1973, 14p NOAA-74042601
Contract NOAA-2-35281
Pub. in Proceedings of the Conference Great Lakes Research (16th), p845-857 1973.

Descriptors: *Lake Erie, *Ice reporting, Stratification, Thickness, Winter, Isotherms, Correlation techniques, Waste disposal, Thermal pollution, Winnebago Lake, Mille Lacs Lake, New York, Wisconsin, Minnesota.
Identifiers: Sea Grant program, *Lake ice.

A flotation-equipped helicopter was used to obtain data on ice thickness, extent of ice coverage and thermal conditions at 50 to 83 stations in Lake Erie from February to April 1972. Without considering pressure ridges and areas of ice rafting, the average (1972) maximum ice thickness in the Western, Center, and Eastern Basins was about 25, 18 and 26 cm, respectively. In contrast to findings from smaller ice-covered lakes, Lake Erie has little to no vertical stratification during winter. In addition, the water temperatures are unusually cold. The 1972 winter transects on Lake Erie suggests no obvious problems of waste heat disposal. (Modified author abstract)

COO-1340-38 PC$4.50/MF$1.45
Colorado State Univ., Fort Collins (Usa). Dept. Of Atmospheric Science.
ROLE OF THE GENERAL CIRCULATION OF THE ATMOSPHERE IN RADIOACTIVE DEBRIS TRANSPORT. TECHNICAL PROGRESS REPORT, FEBRUARY 1, 1973--JUNE 30, 1974.
E. R. Reiter. Mar 74, 28p
Contract AT(11-1)-1340

Descriptors: (*Earth atmosphere, Fallout), (*Fallout, *Diffusion), (*Meteorology, *Research programs), Motion, Radiation monitoring, Radionuclide migration, Tracer techniques.

For abstract, see NSA 29 12, number 29317.

COO-1599-79 PC$4.75/MF$1.45
Michigan State Univ., East Lansing (Usa).
DISSOLVED ORGANIC MATTER AND LAKE METABOLISM. TECHNICAL PROGRESS REPORT, 1 APRIL 1973--31 MARCH 1974.
G. H. Wetzel. 1974, 32p
Contract AT(11-1)-1599

Descriptors: (*Lakes, *Nutrients), (*Carbon, *Diffusion), Aquatic ecosystems, Fresh water, Metabolism, Photosynthesis, Plants, Surface waters.

For abstract, see NSA 29 12, number 31631.

COO-2158-11 PC$4.00/MF$1.45
Wisconsin Univ., Milwaukee (Usa). Center for Great Lakes Studies.
INVESTIGATION OF THE INFLUENCE OF THERMAL DISCHARGE FROM A LARGE ELECTRIC POWER STATION ON THE TEMPERATURE AND NEAR-SHORE CIRCULATION OF LAKE MICHIGAN. QUARTERLY PROGRESS REPORT, 1 JANUARY 1974--31 MARCH 1974.
C. H. Mortimer, and G. K. Sato. 1974, 4p

Descriptors: (*Lake michigan, *Thermal pollution), (*Power plants, *Thermal effluents), Data, Meteorology, Motion, Temperature distribution, Weather, Wind.

For abstract, see NSA 29 12, number 29411.

COO-2222-4 PC$6.25/MF$1.45
Health Research, Inc., Albany, N.Y. (Usa); New York State Dept. Of Health, Albany (Usa).
CHARACTERIZATION OF STACK EFFLUENTS FROM CERTAIN NUCLEAR FACILITIES. FINAL REPORT, APRIL 1, 1972--JUNE 30, 1973.
J. M. Matuszek, C. J. Paperielio, and C. O. Kunz. 1973, 65p
Contract AT(11-1)-2222

Descriptors: (*Bwr type reactors, *Flue gas), (*Pwr type reactors, Flue gas), (*Phwr type reactors, Flue gas), (*Htgr type reactors, Flue gas), Argon 37, Argon 39, Carbon 14, Contamination, Diffusion, Earth atmosphere, Gamma sources, Gaseous wastes, Mass spectrometers, Radiation monitoring, Radioactive wastes, Radiometric analysis, Stack disposal, Tritium.

For abstract, see NSA 29 12, number 29318.

COO-2360-1 PC$4.00/MF$1.45
Drexel Univ., Philadelphia, PA. (Usa).
EFFECTS OF MESOSCALE WEATHER DISTURBANCES ON CONTAMINATION CONCENTRATIONS. FIRST TECHNICAL PROGRESS REPORT, JUNE 1, 1973--FEBRUARY 28, 1974.
C. W. Kreitzberg. 1974, 4p
Contract AT(11-1)-2360

Descriptors: (*Meteorology, *Research programs), (*Earth atmosphere, *Contamination), Contamination, Diffusion, Mathematical models, Motion.

For abstract, see NSA 29 12, number 29319.

LA-UR-73-1004 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
PROBABILISTIC EVALUATION OF FALLOUT EFFECTS ASSOCIATED WITH NUCLEAR AIR BURSTS.
R. V. Fultyn. 1973, 18p CONF-740112-1

Descriptors: (*Earth atmosphere, Fallout), (*Nuclear weapons, *Atmospheric explosions), (*Nuclear explosions, Fallout), (*Fallout, *Diffusion), Atmospheric precipitations, Contamination, Fission products, Mathematical models, Meteorology.

For abstract, see NSA 29 12, number 29321.

LA-5483-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
PROPOSED INTERIM STANDARD FOR PLUTONIUM IN SOILS.
J. W. Healy. Jan 74, 100p
Contract W-7405-eng-36

Descriptors: (*Plutonium, *Health hazards), (*Soils, Plutonium), Food chains, Human populations, Man, Maximum permissible concentration, Maximum permissible intake, Radiation protection, Radionuclide migration, Safety standards.

For abstract, see NSA 29 12, number 29342.

LA-5520-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
RELATIONSHIP BETWEEN AIR SAMPLING DATA FROM GLOVE BOX WORK AREAS AND INHALATION RISK TO THE WORKER.
M. Gonzales, H. J. Ettinger, R. G. Stafford, and C. E. Breckinridge. Mar 74, 12p
Contract W-4705-eng-36

Descriptors: (*Gloveboxes, *Leaks), (*Plutonium 238, *Radiation hazards), (*Plutonium 239, Radiation hazards), (*Personnel, Radiation hazards), Aerosol monitoring, Air samplers, Efficiency, Environment, Inhalation, Mockup, Particle size, Performance testing, Plutonium oxides, Radiation monitoring, Radioactive aerosols, Tracer techniques.

For abstract, see NSA 29 12, number 29320.

NERC-LV-539-17 PC$5.45/MF$1.45
National Environmental Research Center, Las Vegas, Nev. (Usa).
OFF-SITE SURVEILLANCE ACTIVITIES OF THE NATIONAL ENVIRONMENTAL RESEARCH CENTER FROM JULY THROUGH DECEMBER 1970.
Feb 74, 153p
Contract AT(26-1)-539

Descriptors: (*Nevada test site, *Environment), (*Fallout, *Radiation monitoring), (*Tritium, Radiation monitoring), (*Surface air, Radiation monitoring), Ecosystems, Food chains, Human populations, Iodine 131, Iodine 133, Krypton 85, Milk, Nuclear explosions, Radiation doses, Radioactivity, Radionuclide migration, Rulison event, Snow, Strontium 89, Tellurium 132, Thyroid, Underground explosions.

For abstract, see NSA 29 12, number 29322.

NP-19938 PC$29.50/MF$1.45
Bundesministerium des Innern, Bonn (F.R. Germany).
RADIOACTIVE MATERIALS AND DRINKING WATER SUPPLY IN A NUCLEAR CATASTROPHE.
Nov 71, 550p
In German.

Descriptors: (*Drinking water, *Contamination), Fallout, Leading abstract, Nuclear explosions, Research programs.

For abstract, see NSA 29 12, number 29351.

NVO-1253-5 PC$4.50/MF$1.45
Nevada Univ., Reno (Usa). Desert Research Inst.
HYDROLOGIC DATA BANK USERS GUIDE. USER INFORMATION BULLETIN 4.
C. D. Lakeotes, and H. N. Friesen. Jan 74, 26p
Contract AT(29-2)-1253

Descriptors: (*Hydrology, *Data compilation), (*Alaska, *Ground water), (*Colorado, Ground water), (*Nevada, Ground water), Abundance, Chemical composition, Computer codes, Data, Surface waters, Tritium.

For abstract, see NSA 29 12, number 29399.

NVO-410-22 PC$5.45/MF$1.45
Reynolds Electrical and Engineering CO., Inc., Las Vegas, Nev. (Usa). Environmental Sciences Dept.
ENVIRONMENTAL RADIOACTIVITY AT THE NEVADA TEST SITE, JULY 1967 THROUGH JUNE 1968.
Jul 69, 89p
Contract AT(26-1)-410

Descriptors: (*Nevada test site, *Fallout), (*Surface waters, *Radiation monitoring), (*Ground water, Radiation monitoring), (*Soils, Radiation monitoring), Beta sources, Environ-

ment, Gamma sources, Plants, Plutonium, Radioactivity, Surface air.

For abstract, see NSA 29 12, number 29325.

ORO-2529-41 PC$9.00/MF$1.45
Arkansas Univ., Fayetteville (Usa). Dept. Of Chemistry.
ATMOSPHERIC RADIOCHEMISTRY. ANNUAL PROGRESS REPORT.
P. K. Kuroda. 30 Apr 74, 118p
Contract AT(40-1)-2529

Descriptors: (*Earth atmosphere, *Radiation monitoring), (*Nuclear explosions, Global fallout), (*Global fallout, Radiation monitoring), (*Strontium 90, Radiation monitoring), Arkansas, Atmospheric explosions, Cerium isotopes, Cesium 137, China, France, Japan, Nuclear weapons, Radioactivity, Rain, Turkey.

For abstract, see NSA 29 12, number 29326.

ORO-3944-7 PC$4.25/MF$1.45
Miami Univ., Fla. (Usa). Rosenstiel School of Marine and Atmospheric Sciences.
STUDY OF TRITIATED HYDROGEN AND ITS COMPOUNDS IN THE ENVIRONMENT. PROGRESS REPORT, JULY 1, 1973--MARCH 31, 1974.
H. G. Oestlund. 1974, 24p
Contract AT(40-1)-3944

Descriptors: (*Troposphere, *Aerial monitoring), (*Tritium, Aerial monitoring), (*Surface air, Aerial monitoring), Contamination, Leaks, Meteorology, Thermonuclear explosions, Tritium compounds, Underground explosions, Water.

For abstract, see NSA 29 12, number 29327.

PB-232 790/6GA PC$9.00/MF$1.45
Geological Survey, Washington, D.C. Water Resources Div.
INDEX TO U.S. GEOLOGICAL SURVEY COMPUTER FILES CONTAINING DAILY VALUES FOR WATER PARAMETERS TO SEPTEMBER 30, 1971. CENTRAL REGION.
Water-resources investigations, (Final),
Charles R. Showen, and Neil G. Stuthmann. Jun 73, 447p* USGS/WRI-27-73, USGS-WRD-74-019
See also PB-232 791.

Descriptors: *Hydrology, *Water resources, *Central United States, *Indexes(Documentation), Printouts, Tables(Data), Surface waters, Dissolved organic matter, Dissolved gases, Stream flow, Water pollution, Sediments, Water quality.

The report contains lists of stations in the Central United States at which the U.S. Geological Survey collects water data either on a continuous basis or at least on a daily basis. The files contain daily values for streamflow, reservoir levels or contents, water temperatures, specific conductance, sediment discharge plus data for several other quality parameters that are measured by means of monitoring equipment or result from analyses of samples collected on a daily basis. The stations are listed according to station number whithin each State. The report lists the available retrieval options, the machine-readable output options, user charges, and how to obtain the data.

PB-232 791/4GA PC$5.75/MF$1.45
Geological Survey, Washington, D.C. Water Resources Div.
INDEX TO U.S. GEOLOGICAL SURVEY COMPUTER FILES CONTAINING DAILY VALUES FOR WATER PARAMETERS TO SEPTEMBER 30, 1971. SOUTHEASTERN REGION.
Water-resources investigations (Final rept.),
Charles R. Showen, and Neil G. Stuthmann. Jun 73, 211p* USGS/WRI-26-73, USGS-WRD-74-013
See also PB-232 792.

Descriptors: *Hydrology, *Water resources, *Southeast United States, *Indexes(Documentation), Printouts, Tables(Data), Water quality, Surface waters, Stream flow, Dissolved organic matter, Dissolved gases, Water pollution, Sediments.

The report contains lists of stations in the Southeast United States at which the U.S. Geological Survey collects water data either on a continuous basis or at least on a daily basis. The files contain daily values for streamflow, reservoir levels or contents, water temperatures, specific conductance, sediment discharge plus data for several other quality parameters that are measured by means of monitoring equipment or result from analyses of samples collected on a daily basis. The stations are listed according to station number within each State. The report lists the available retrieval options, the machine-readable output options, user charges, and how to obtain the data.

PB-232 792/2GA PC$15.00/MF$1.45
Geological Survey, Washington, D.C. Water Resources Div.
INDEX TO WATER-QUALITY DATA AVAILABLE FROM THE U.S. GEOLOGICAL SURVEY IN MACHINE-READABLE FORM TO DECEMBER 31, 1972. SOUTHEASTERN REGION.
Water-resources investigations (Final rept.).
Charles R. Showen, and Owen O. Williams. Jun 73, 762p* USGS/WRI-22-73, USGS-WRD-74-018
See also PB-232 793.

Descriptors: *Hydrology, *Water resources, *Southeast United States, *Indexes(Documentation), Printouts, Tables(Data), Water quality, Surface waters, Stream flow, Dissolved organic matter, Dissolved gases, Water pollution, Sediments, Ground water.

The report lists water quality stations in the Southeast United States operated by the Geological Survey for which data are available in machine-readable form. The data are the results of analyses of water samples and indicate the chemical and physical characteristics of surface and ground water. The stations are listed according to station number within each State. The water quality data are identified by 5-digit parameter codes and are grouped into twenty-one parameter categories. The analytical results for all samples in any one year are then grouped within the parameter categories. The report lists the available retrieval options, the machine-readable output, options, user charges, and how to obtain the data.

PB-232 793/0GA PC$8.25/MF$1.45
Geological Survey, Washington, D.C. Water Resources Div.
INDEX TO U.S. GEOLOGICAL SURVEY COMPUTER FILED CONTAINING DAILY VALUES FOR WATER PARAMETERS TO SEPTEMBER 30, 1971. WESTERN REGION.
Water-resources investigations (Final rept.),
Charles R. Showen, and Neil G. Stuthmann. Jun 73, 392p* USGS/WRI-28-73, USGS/WRD-74-017
See also PB-232 794.

Descriptors: *Hydrology, *Water resources, *Western United States, *Indexes(Documentation), Printouts, Tables(Data), Water quality, Surface waters, Ground water, Stream flow, Dissolved organic matter, Dissolved gases, Water pollution, Sediments.

The report contains lists of stations in the Western United States at which the U.S. Geological Survey collects water data either on a continuous basis or at least on a daily basis. The files contain daily values for streamflow, reservoir levels or contents, water temperatures, specific conductance, sediment discharge plus data for several other quality parameters that are measured by means of monitoring equipment or result from analyses of samples collected on a daily basis. The stations are listed according to station number within each State. The report lists the available retrieval options, the machine-readable output options, user charges, and how to obtain the data.

PB-232 794/8GA PC$10.00/MF$1.45
Geological Survey, Washington, D.C. Water resources Div.
INDEX TO WATER-QUALITY DATA AVAILABLE FROM THE U.S. GEOLOGICAL SURVEY IN MACHINE-READABLE FORM TO DECEMBER 31, 1972. WESTERN REGION.
Water-resources investigations (Final),
Charles R. Showen, and Owen O. Williams. Jun 73, 521p* USGS/WRI-24-73, USGS/WRD-74-016
See also PB-232 790.

Descriptors: *Hydrology, *Water resources, *Western United States, *Indexes(Documentation), Printouts, Tables(Data), Water quality, Surface waters, Ground water, Stream flow, Dissolved organic matter, Dissolved gases, Water pollution, Sediments.

The report lists water quality stations in the Western United States operated by the Geological Survey for which data are available in machine-readable form. The data are the results of analyses of water samples and indicate the chemical and physical characteristics of surface and ground water. The stations are listed according to station number within each State. The water quality data are identified by 5-digit parameter codes and are grouped into twenty-one parameter categories. The analytical results for all samples in any one year are then grouped within the parameter categories. The report lists the available retrieval options, the machine-readable output options, user charges, and how to obtain the data.

PB-232 922/5GA PC$17.00/MF$1.45
Geological Survey, Washington D.C. Water Resources Div.
INDEX TO WATER-QUALITY DATA AVAILABLE FROM THE U.S. GEOLOGICAL SURVEY IN MACHINE-READABLE FORM TO DECEMBER 31, 1972. CENTRAL REGION.
Water-resources investigations rept. (Final),
Charles R. Showen, and Owen O. Williams. Jun 73, 959p* USGS/WRI-23-73, USGS/WRD-74-020
See also PB-222 424.

Descriptors: *Hydrology, *Water quality, Surface waters, Ground water, Chemical properties, Physical properties, Suspended sediments, Water pollution, Biochemical oxygen demand, Dissolved organic matter, Indexes(Documentation), Tables(Data).
Identifiers: *Central region(United States), *Water quality data.

The report lists water quality stations operated by the Geological Survey for which data are available in machine-readable form. The data are the results of analyses of water samples and indicate the chemical and physical characteristics of surface and ground water. The stations are listed according to station number within each State. The water quality data are identified by five-digit parameter codes and are grouped into twenty-one parameter categories. The analytical results for all samples in any one year are then grouped within the parameter categories. The report lists the available retrieval options, the machine-readable output options, user charges, and how to obtain the data.

PB-232 962/1GA PC$3.75/MF$1.45
Geological Survey, Menlo Park, Calif. Water Resources Div.
SEDIMENT DISCHARGE IN THE TRINITY RIVER BASIN, CALIFORNIA.
Water-resources investigations (Final),
J. M. Knott. Apr 74, 62p USGS/WRI-49-73, USGS/WRD-74-022

Descriptors: *Suspended sediments, *Trinity River, Sediment transport, Stream flow, Floods, Particle size, Soils, Statistical data, Bed load, California, Water quality.

Long-term total-sediment discharge of the Trinity River and selected tributaries is estimated. Water-discharge data for the period 1912-70 and sediment data collected between 1955 and 1970 were used to evaluate trends and relations between sediment discharge (suspended and bedload) and water discharge. The hydraulic and sediment-transport characteristics of many of the streams in the basin were significantly altered by the December 1964 flood. Data indicate that the depth and velocity of streams changed drastically; and that for equal magnitudes of streamflow, suspended-sediment discharges after the 1964 flood were several times larger than before the flood. The long-term average annual sediment discharge of the Trinity River near Hoopa is estimated to be 3,120,000 tons (2,830,000 metric tons). The percentage of clay, silt, and sand or coarser material at this station is estimated to be 20, 32, and 48 percent. Bedload discharge is estimated to be 19 percent of the total-sediment discharge.

PB-232 986/0GA PC$4.00/MF$1.45
Kansas Water Resources Research Inst., Manhattan.
DEVELOPMENT OF WATER QUALITY MODELS USING SPECTRAL ANALYSIS AND PARAMETER ESTIMATION TECHNIQUES.
Project completion rept., Jul 70-Dec 73,
L.T. Fan, and Owen O. Williams. 1974, 87p
Contrib-140 W74-08936, OWRR-B-021-KAN(8)
Contract DI-14-31-0001-3282

Descriptors: *Rivers, *Spectrum analysis, *Water quality, Mathematical models, Cross correlation, Covariance, Autocorrelation, Biochemical oxygen demand, Temperature, Flow rate, Dissolved gases, Oxygen, Coliform bacteria, Ohio River, Detroit River, Coosa River, Missouri River.
Identifiers: Water quality data, Parameter estimation.

This research was concerned with the analysis and interpretation of water quality data in order to develop improved mathematical models for predicting water quality. Spectral analysis was employed to analyze water quality data from the Coosa, Detroit, Missouri and Ohio rivers. Mathematical models were developed to represent the processes taking place in the stream. Parameter estimation techniques were used to determine the value of the constants and the parameters in the model equations. The study also included (1) estimation of missing values in water quality data, (2) experimental simulation of thermal discharge monitoring and application of spectral analysis techniques, (3) compilation of water quality data and parameters from Kansas rivers and streams, (4) identification of parameters in transient water quality models from stochastic data, and (5) evaluation of methods for estimating stream water quality parameters in a transient model from stochastic data. (Modified author abstract)

PNE-WW-34 PC$4.50/MF$1.45
Eberline Instrument Corp., Santa Fe, N.Mex. (Usa).
ENVIRONMENTAL MONITORING REPORT, PERIOD COVERING AUGUST 1, 1973 THRU DECEMBER 8, 1973 FOR EL PASO NATURAL GAS COMPANY: PROJECT WAGON WHEEL.
26p

Descriptors: (*Wagon wheel event, *Radiation monitoring), (*Earth atmosphere, Radiation monitoring), (*Surface waters, Radiation monitoring), (*Atmospheric precipitations, Radiation monitoring), Animals, Beta sources, Environment, Fishes, Gamma sources, Milk, Plants, Radionuclide kinetics, Radionuclide migration, Strontium 90, Tritium, Urine.

For abstract, see NSA 29 12, number 29328.

SLA-74-167 PC$4.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
ENVIRONMENTAL MONITORING REPORT FOR SANDIA LABORATORIES FOR 1973.
L. W. Brewer. Apr 74, 21p
Contract AT(29-1)-789

Descriptors: (*New mexico, *Radioactivity), (*Water, *Radiation monitoring), (*Soils, Radiation monitoring), (*Plants, Radiation monitoring), Alpha sources, Beta sources, Cesium 137, Environment, Plutonium, Radiochemical analysis, Radionuclide kinetics, Radionuclide migration, Strontium 90.

For abstract, see NSA 29 12, number 29343.

SSI-1974-2 PC$4.00/MF$1.45
Statens Seruminstitut, Copenhagen (Denmark).
AMOUNT OF STRONTIUM-90 IN DAIRY MILK, 1973.
J. Suomela. Jan 74, 6p
In Swedish.

Descriptors: (*Strontium 90, *Radiation monitoring), (*Milk, *Radioactivity), (*Sweden, Radiation monitoring), Contamination.

For abstract, see NSA 29 12, number 29374.

SSI-1974-9 PC$4.00/MF$1.45
Statens Seruminstitut, Copenhagen (Denmark).
ANNUAL REPORT TO THE SWEDISH ATOMIC RESEARCH COUNCIL 1973.
B. Lindell, J. O. Snihs, G. A. Swedjemark, and G. Bengtsson. Jan 74, 18p
In Swedish.

Descriptors: (*Mines, *Natural radioactivity), (*Buildings, Natural radioactivity), (*Environment, Natural radioactivity), (*Drinking water, Natural radioactivity), Metabolism, Radiation monitoring, Radioactivity, Daughter products, Miners, Radiation hazards, Radium, Radon, Cesium 137, Fallout, Food, Man, Radiation detectors, Strontium 90.

For abstract, see NSA 29 12, number 29329.

UCRL-51530 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
RAINOUT STUDIES AT LAWRENCE LIVERMORE LABORATORY.
J. B. Knox, and A. L. Williams. 11 Feb 74, 20p
Contract W-7405-eng-48

Descriptors: (*Nuclear explosions, Radioactive clouds), (*Radioactive clouds, *Precipitation scavenging), Atmospheric explosions, Atmospheric precipitations, Distribution, Earth atmosphere, Fallout, Human populations, Particle size, Radiation doses, Radiation hazards, Radioactive aerosols, Research programs, Washout.

For abstract, see NSA 29 12, number 29331.

UCRL-51547 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
ENVIRONMENTAL LEVELS OF RADIOACTIVITY IN THE VICINITY OF THE LAWRENCE LIVERMORE LABORATORY. 1973 ANNUAL REPORT.
W. J. Silver, C. L. Lindeken, J. W. Meadows, W. H. Hutchin, and D. R. McIntyre. 4 Mar 74, 49p

Descriptors: (*Lawrence livermore laboratory, *Radioactivity), (*Surface air, *Radiation monitoring), (*Soils, Radiation monitoring), (*Surface waters, Radiation monitoring), Beta sources, Diet, Environment, Fallout, Gamma radiation, Human populations, Plants, Plutonium 238, Plutonium 239, Radiation doses, Radionuclide kinetics, Strontium 90, Tritium, Uranium 235, Uranium 238.

For abstract, see NSA 29 12, number 29332.

UCRL-75484 PC$5.25/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
RESUSPENSION OF PLUTONIUM: A PROGRESS REPORT.
L. R. Anspaugh, P. L. Phelps, N. C. Kennedy, H. G. Booth, and R. W. Goluba. 19 Feb 74, 62p

Descriptors: (*Fallout, *Distribution), (*Plutonium, Distribution), (*Soils, *Radiation monitoring), (*Nevada test site, Fallout), Aerosol monitoring, Air samplers, Americium 241, Earth atmosphere, Meteorology, Nuclear explosions, Particle size, Plutonium 238, Plutonium 239, Plutonium 240, Radiation hazards, Radioactive aerosols, Radionuclide migration, Research programs, Schooner event, Usa, Wind.

For abstract, see NSA 29 12, number 29333.

8I. Mining Engineering

AD-780 220/0GA PC$4.50/MF$1.45
Wisconsin Univ Madison
DETERMINATION OF IN-SITU STRESSES AROUND UNDERGROUND EXCAVATIONS BY MEANS OF HYDRAULIC FRACTURING.
Final rept. 1 Jul 72-31 Mar 74,
Bezalel C. Haimson. 1 Apr 74, 114p
Contract H0220080, ARPA Order-1579

Descriptors: *Rock mechanics, *Stresses, *Excavation, Fractures(Mechanics), Test methods.
Identifiers: *Underground excavations, Underground mining, *Quartzites.

Laboratory tests have been conducted to determine the mechanical properties of Coeur d'Alene quartize and to establish whether this highly inhomogeneous, precracked variable rock is suitable for hydraulic fracturing as a method of in-situ stress measurement. It was found that basically the Coeur d'Alene quartzite is amenable to hydraulic fracturing testing. The rock has no consistent anisotropy, but is inhomogeneous with physical property variations depending on fabric changes and existence of fractures and mica inclusions. Hydrofracture direction is always perpendicular to the smallest horizontal stress notwithstanding rock condition. Field stress measurements in the Coeur d'Alene mines using the hydraulic fracturing technique are recommended. (Modified author abstract)

PAT-APPL-465 055 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
METHOD OF OBTAINING CORE SAMPLES.
Patent Application,
Robert W. Miller. Filed 29 Apr 74, 7p
DOCKET/MIN-2050
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Drilling machines(Tools), *Coring, *Patent applications, Bituminous coal, Sampling.
Identifiers: PAT-CL-125-20.

The patent application describes a method of obtaining core samples from soft rock material like soft bituminous coal. The sample of material is rigidly fixed to a drill platform so that its movement is restricted in every dimension and it has an exposed surface. A drill is fixed to the earth by a rigid frame support with its drill barrel being restrained from vibrations and its hollow bit facing towards the exposed surface of the sample. The drill's cutting surface engages the sample to cut out the core sample with a rotational speed of about 1500 rpms. At the same time water acting as a coolant and as an aid to dislodge the cuttings around the ore sample, is supplied to the drill bit. Once the core sample is drilled, the ore barrel is retracted away from the material and tapped lightly to release the intact sample from the hollow drill bit.

PATENT-3 807 557 Not available NTIS
Department of the Interior, Washington, D.C.
FLOTATION OF PYRITE FROM COAL.
Patent,
Kenneth J. Miller. Filed 11 Aug 72, patented 30 Apr 74, 5p PAT-APPL-279 903, DOCKET/MIN-1952
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Pyrite, *Flotation, *Coal, *Patents.
Identifiers: PAT-CL-209-166, Air pollution control.

The patent describes pyrite removal from coal by means of a two-stage froth flotation process. In the first stage, coarse pyrite is removed as underflow in a conventional froth flotation operation. In the second stage, the froth product from the first stage is subjected to froth flotation using a coal flotation depressant and a pyrite flotation collector, thereby removing a substantial proportion of fine pyrite.

PB-232 703/9GA PC$4.50/MF$1.45
Geological Survey, Denver, Colo.
A COMPUTER PROGRAM FOR THE AUTOMATIC INTERPRETATION OF SCHLUMBERGER SOUNDING CURVES OVER HORIZONTALLY STRATIFIED MEDIA.
Final rept.,
Adel A. R. Zohdy. 1973, 27p USGS-GD-74-017

Descriptors: *Resistivity exploration, *Computer programs, FORTRAN, Curve fitting.
Identifiers: FORTRAN 4 programming language, IBM 360/65 computers, DEC 1070 computers.

Formulas defining two types of modified Dar Zarrouk curves are used to invert Schlumberger sounding curves using an iterative procedure. The number of layers, which is equal to the number of points on the inverted curve, is reduced by automatically smoothing the corresponding DZ curve.

PB-232 727/8GA PC$4.00/MF$1.45
Geological Survey, Denver, Colo.
A COMPUTER PROGRAM FOR THE CALCULATION OF BIPOLE-DIPOLE APPARENT-RESISTIVITY MAPS OVER HORIZONTALLY STRATIFIED MEDIA.
Final rept. 1973-1974,
Adel A. R. Zohdy, and William D. Stanley. 1974, 11p USGS-GD-74-016

Descriptors: *Resistivity exploration, *Mapping, *Computer programs, Dipoles, FORTRAN.
Identifiers: FORTRAN 4 programming language, IBM 360/65 computers, DEC 1070 computers.

Formulas are given for the calculation of the following bipole-dipole apparent resistivities: primary field, simple total field, total field, perpendicular, and parallel. The formulas are valid for horizontally stratified media.

SLA-74-125 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
PROGRAM PLAN FOR IMPROVING DEEP DRILLING.
M. M. Newsom. Mar 74, 11p
Contract AT(29-1)-789

Descriptors: (*Natural gas, *Production), (*Petroleum, Production), Cavities, Cost, Electrical equipment, Exploration, Explosions, Nondestructive testing, Oil drilling, Rock drilling, Shock waves, Wear.

For abstract, see NSA 29 12, number 31477.

UCRL-51520 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HYDROEXPLOSIVE MINING: A METHOD FOR DEVELOPING DEEP, THICK SEAMS OF COAL.
P. B. Archibald. 8 Mar 74, 18p
Contract W-7405-eng-48

Descriptors: (*Coal, *Mining), Cavities, Economics, Environment, Fractures, Surfaces, Underground explosions, Water.

For abstract, see NSA 29 12, number 31488.

UCRL-75242(Rev.1) PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
OUTLOOK FOR OIL SHALE.
A. E. Lewis. 25 Feb 74, 13p CONF-740213-2

Descriptors: Colorado, Economics, Energy reserves, Energy sources, Environment, Geology, Legal aspects, Management, Oil shales, Planning, Production, Shale oil, Utah, Wyoming.

For abstract, see NSA 29 12, number 31490.

8J. Physical Oceanography

AD-779 856/4GA PC$4.75/MF$1.45
Washington Univ Seattle Applied Physics Lab
STUDIES IN THE MARGINAL ICE ZONE OF THE CHUKCHI SEA: ANALYSIS OF 1972 DATA,
Gerald R. Garrison, Elbert A. Pence, Henry R. Feldman, and Shashikant R. Shah. 14 Mar 74, 142p Rept no. APL-UW-7311
Contract N00123-71-C-1333, ARPA Order-1782

Descriptors: *Oceanographic data, *Sea ice, *Underwater sound, *Chukchi Sea, Thermoclines, Sound transmission, Underwater sound signals, Scattering, Reverberation, Acoustic velocity, Ocean currents, Wind, Temperature.
Identifiers: Ice floes.

The report is a summary and analysis of studies in the Marginal Ice Zone of the Chukchi Sea in 1972 by the Applied Physics Laboratory of the University of Washington. A camp on an ice floe was established and occupied for two weeks during the summer. Temperature profiles of the water under the floe were taken simultaneously at four stations every hour to measure the character and change of the thermal microstructure in the water. At the same time, acoustic pulses were transmitted from one station to another to determine the effect of the thermal microstructure on acoustic propagation. Two 1-week cruises across the Chukchi Sea were made, one before and one after the ice floe occupancy, to study the intrusion of warm Pacific water which occurs every summer and to measure acoustic scattering from biological layers. (Modified author abstract)

AD-779 910/9GA PC$9.25/MF$1.45
Scripps Institution of Oceanography La Jolla Calif
NORTH PACIFIC STUDY: PHYSICAL DATA REPORT. CRUISES 1-12; SEPTEMBER 1968 - SEPTEMBER 1971.
Data rept.
1974, 123p Rept no. SIO-Ref-73-26
Contract N00014-69-A-0200-6043
Report on North Pacific Experiment - NORPAX.

Descriptors: *Pacific Ocean, *Oceanographic data, *Meteorological data, Tables(Data), Temperature, Salinity, Depth.
Identifiers: *North Pacific Ocean.

The data presented were collected on ten cruises by the USCGC Acushnet and one cruise by the RV Thomas Washington for the North Pacific Study Program. These cruises were for the purpose of deploying and servicing instrumented stations in the North Central Pacific to study the large-scale ocean and atmosphere interrelationships in the Pacific, and were funded under contracts with the Office of Naval Research. Tabulated in this report for the cruises of this program are temperature and salinity data from S/T/D lowerings and Nansen bottle casts collected for comparison with the data from the moored instrument stations.

AD-780 151/7GA Not available NTIS
Defence Research Establishment Ottawa (Ontario)
ICE REGIME AND ICE TRANSPORT IN NARES STRAIT,
Moira Dunbar. 1973, 11p Rept no. DREO-TN-72-31
Summaries in French and Russian.
Availability: Pub. in Arctic, v26 n4 p282-291 Dec 73.

Descriptors: *Sea ice, *Arctic Ocean, Transport properties, Ice reporting, Aerial reconnaissance, Estimates, Winter, Freezing, Canada.
Identifiers: *Nares Strait, Ice transport, Ice breakup.

In order to assess the part played by ice export through the Canadian Arctic Archipelago in the heat budget of the Arctic Ocean, one of the factors that must be known is the length of time per year that the channels are sealed by fast ice. To establish this for Nares Strait a series of flights was undertaken through the winters of 1970-71 and 1971-72. The resulting observations, combined with a search of historical records, suggest that the date of consolidation of ice in this channel tends to be late. A tentative calculation of annual export leads to the conclusion that the contribution of the Canadian channels may be greater than has been supposed. (Author)

AD-780 155/8GA Not available NTIS
Defence Research Establishment Pacific Victoria (British Columbia)
WIND NOISE UNDER WINTER ICE FIELDS,
A. R. Milne. 16 Oct 73, 8p Rept no. DREP-Reprint-74-8
Revision of report dated 15 Aug 73.
Availability: Pub. in Jnl. of Geophysical Research, v79 n6 p803-809, 20 Feb 74.

Descriptors: *Wind, *Sea ice, *Underwater sound, Noise, Power spectra, Snow, Canada.
Identifiers: Underwater sound sources.

Wind blowing over a snow layer on sea ice produces noise in the water beneath as a result of a multitude of snow grain impacts on the upper boundary of the snow. The noise intensity is independent of snow grain size and depends primarily on the snow grain flow. (Modified author abstract)

AD-780 190/5GA PC$3.25/MF$1.45
Alaska Univ College Inst of Marine Science
DYNAMICS AND FORMATION OF WATER MASSES OF THE GULF OF ALASKA.
Final rept.,
Thomas C. Royer. Apr 74, 46p
Contract N00014-67-A-0317-0002

Descriptors: *Hydrography, *Alaska Gulf, Oceanographic data, Salinity, Temperature, Depth, Ocean currents.
Identifiers: *Water masses.

The report presents investigations into seasonal water structures in the Gulf of Alaska began in 1970 under ONR sponsorship. A series of eight hydrographic cruises were conducted on the northern shelf in the Gulf of Alaska from December 1970 through October 1972. The primary purpose of these expeditions was to determine if in winter the shelf is a region where intermediate water formation occurs. This study indicates that the region is not such a source of intermediate water. However, valuable observations and conclusions have been drawn from the data obtained on these cruises. These data represent the first seasonal observations in the Gulf of Alaska. These are also the first hydrographic observations made on that shelf in the fall quarter of any year.

AD-780 200/2GA PC$3.00/MF$1.45
Oregon State Univ Corvallis School of Oceanography
EXPOSURE: A NEWSLETTER FOR OCEAN TECHNOLOGISTS. VOLUME 1, NUMBER 1.
Technical rept.,
Roderick Mesecar. 1 Mar 73, 14p
Contract N00014-67-A-0369-0007
See also report dated 1 Mar 73, AD-780 201.

Descriptors: *Oceanographic equipment, *Periodicals, Release mechanisms, Time dependence, Ballast, Plankton, Samplers, Temperature measuring instruments.

Contents:
Time release mechanism;
Multiple trigger ballast release;
Midwater trawl system;
Temperature microstructure measuring instruments;
Thermistor-controlled wien bridge oscillator.

AD-780 201/0GA PC$3.00/MF$1.45
Oregon State Univ Corvallis School of Oceanography
EXPOSURE: A NEWSLETTER FOR OCEAN TECHNOLOGISTS. VOLUME 1, NUMBER 2. SMALL OCEAN BOTTOM SEISMIC CAPSULE.
Technical rept.,
Roderick Mesecar. 1 Mar 73, 18p
Contract N00014-67-A-0369-0007
See also report dated 1 Mar 73, AD-780 200, and AD-780 202.

Descriptors: *Oceanographic equipment, *Periodicals, Seismometers, Ocean currents, Flowmeters, Underwater equipment, Underwater vehicles, Temperature measuring instruments, Spar buoys.

Contents:
Small ocean bottom seismic capsule;
Vector averaging current meter;
Four-sphere ocean bottom instrument capsule;
Profiling oceanographic sensor;
Spar buoy;
Cyclesonde - an unattended profiling instrument/vehicle for oceanographic measurements.

AD-780 202/8GA PC$3.00/MF$1.45
Oregon State Univ Corvallis School of Oceanography
EXPOSURE: A NEWSLETTER FOR OCEAN TECHNOLOGISTS. VOLUME 1, NUMBER 3. A TIME-BASE FOR INSTRUMENTATION.
Technical rept.,
Roderick Mesecar. 1 Mar 73, 18p
Contract N00014-67-A-0369-0007
See also report dated 1 Mar 73, AD-780 201, and AD-780 203.

Descriptors: *Oceanographic equipment, *Periodicals, Timing devices, Ocean currents, Flowmeters, Spar buoys, Ocean waves, Recording systems, Data acquisition, Photometers.

Contents:
A time-base for instrumentation;
Effect of standoff rods on rotation rate of a savonius rotor;
A modular semi-spar surface buoy;
Wave recorder;
Breaking 'ground-loops' with in instrumentation - quality amplifier (IQA);
Spectral radiance meter.

AD-780 203/6GA PC$3.00/MF$1.45
Oregon State Univ Corvallis School of Oceanography
EXPOSURE: A NEWSLETTER FOR OCEAN TECHNOLOGISTS. VOLUME 1, NUMBER 4. AUTOPROBE.
Technical rept.,
Roderick Mesecar. 1 Mar 73, 13p
Contract N00014-67-A-0369-0007
See also report dated 1 Mar 73, AD-780 202, and AD-780 204.

Descriptors: *Oceanographic equipment, *Periodicals, Underwater equipment, Platforms, Transducers, Mounts, Ocean currents, Flowmeters.

Contents:
Autoprobe;
Portable transducer mounts for AGOR research ships;
Electromagnetic flowmeter measurement of horizontal particle velocity of wave in the field.

AD-780 204/4GA PC$3.00/MF$1.45
Oregon State Univ Corvallis School of Oceanography
EXPOSURE: A NEWSLETTER FOR OCEAN TECHNOLOGISTS. VOLUME 1, NUMBER 5. A FREE VEHICLE INSTRUMENT PACKAGE FOR THE SHALLOW MARINE ENVIRONMENT.
Technical rept.,
Roderick Mesecar. 1 Mar 73, 13p
Contract N00014-67-A-0369-0007
See also report dated 1 Mar 73, AD-780 203, and AD-780 205.

Descriptors: *Oceanographic equipment, *Periodicals, Underwater equipment, Stabilized platforms, Transponders, Housings(Enclosures), Electric connectors, Ocean currents, Flowmeters.

Contents:
A free vehicle instrument package for the shallow marine environment;
A low cost deep sea instrument housing;
Impeller type current speed transducer.

AD-780 205/1GA PC$3.00/MF$1.45
Oregon State Univ Corvallis School of Oceanography
EXPOSURE: A NEWSLETTER FOR OCEAN TECHNOLOGISTS. VOLUME 1, NUMBER 6. SOME PHILOSOPHY IN OCEAN TECHNOLOGY.
Technical rept.,
Roderick Mesecar. 1 Mar 73, 14p
Contract N00014-67-A-0369-0007
See also report dated 1 Mar 73, AD-780 204.

Descriptors: *Oceanographic equipment, *Periodicals, Oceanography, Philosophy, Bolts, Explosive actuators, Sonar transducers, Indicator lights.

Contents:
Some philosophy in ocean technology;
A titanium alloy underwater exploding bolt;
Hull mounted 3.5 kilohertz transducer;
Low-cost flashing light.

AD-780 297/8GA Reprint
Woods Hole Oceanographic Institution Mass
MORPHOLOGY AND CARBONATE SEDIMENTATION ON SHALLOW BANKS IN THE ALBORAN SEA,
John D. Milliman, Yehezkiel Weiler, and Daniel J. Stanley. 1972, 20p Rept no. WHOI-Contrib-2808 NSF/IDOE-74-14
Contract N00014-66-C-0241, Grant NSF-GX-28193
Availability: Pub. in The Mediterranean Sea, p241-259 1972.

Descriptors: *Sediments, *Marine geology, Petrography, Ocean bottom topography, Ocean bottom sampling, Lithology, Marine biology, Carbonates, Mediterranean Sea.
Identifiers: *Alboran Sea, Radiocarbon dating.

Alboran Ridge, Western Alboran Ridge and Xauen Bank are a part of a 180 km-long linear complex of shallow banks in the Alboran Sea. The banks are volcanic in origin and capped with Pliocene-Quaternary sediments. The uniformly shallow flat tops at 100 to 120 m and prominent terraces at somewhat greater depths may reflect the influences of shallow-water erosion, perhaps during lower stands of sea level. Petrographic analyses of the sediment samples included quantitative identification of carbonate components, determination of carbonate mineralogy by x-ray diffraction, and analysis of carbonate content by acid leaching. After carbonate was removed, the noncarbonate fraction was studied petrographically. In addition, gravel, sand, silt and clay contents were calculated by standard sieve and pipette analyses. A total of 10 samples and sample splits were submitted for carbon-14 age dating.

AD-780 325/7GA Not available NTIS
Rand Corp Santa Monica Calif
A NEW TABULATION OF THE SCRIPPS TOPOGRAPHY ON A 1 DEG. GLOBAL GRID. PART II. OCEAN DEPTHS,
W. L. Gates, and A. B. Nelson. Nov 73, 140p Rept no. R-1277-ARPA
Contract DAHC15-73-C-0181, ARPA Order-189-1
Availability: Paper copy available forQQrom The RAND Corporation, Santa Monica, California 90406. PC$3.00.

Descriptors: *Ocean bottom topography, *Oceanographic data, *Bathymetry, Depth, Tables(Data).

The report contains a revision and retabulation of world-wide ocean depth data originally prepared at the Scripps Institution of Oceanography. Revisions to the original data include the redefinition of coastal regions and the insertion of islands and lakes; no revision has been made in the remaining oceanic depths. The newly formatted global 1-deg tabulations of ocean depth are supplemented by a global analysis, frequency histograms, and zonal averages.

AD-780 341/4GA Reprint
Naval Oceanographic Office Washington D C
TOPOGRAPHY AND STRUCTURE OF THE WESTERN PUERTO RICO TRENCH,
Terry S. Maley, Frederick D. Sieber, and G. Leonard Johnson. 5 Oct 73, 11p
Revision of report dated 17 May 73.
Availability: Pub. in Geological Society of America Bulletin, v85 p513-518 Apr 74.

Descriptors: *Ocean bottom topography, *Bathymetry, *North Atlantic Ocean, Marine geophysics, Mapping, Sonar.
Identifiers: Puerto Rico Trench.

The U.S. Naval Oceanographic Office conducted a bathymetric survey in January 1972 over the western Puerto Rico Trench by using a highly directional, multiple-beam sonar system. The system is composed of 15 independent, 2 2/3 degree beams, of which two corresponding side beams may be displayed on one graphic recorder while the vertical beam is displayed on a second recorder. The axis of maximum depth of the western Puerto Rico Trench was determined for 70 n mi. The method required only one east-west trackline along the abyssal plain; the vertical beam and two corresponding side beams were utilized.

COM-74-11099/0GA PC$4.00/MF$1.45
Georgia Marine Science Center, Savannah.
CHEMICAL SURVEY OF WATERS ADJACENT TO COLONELS ISLAND, GLYNN COUNTY, GEORGIA.
Technical rept.,
William M. Dunstan, and Robert R. Stickney. Mar 74, 15p TR-74-1 NOAA-74050706

Descriptors: *Water quality, *Estuaries, *Water chemistry, Tides, Temperature, Salinity, Oxygen, pH, Ammonia, Chlorophyll, Nitrates, Phosphates, Seasonal variations, Brunswick River, Georgia.
Identifiers: Colonels Island, Sea Grant Program, Glynn County(Georgia).

Basic measurements of the water quality of the Brunswick River adjacent to Colonels Island, Georgia were made over a tidal cycle. The reported values for temperature, salinity, oxygen, pH, ammonia, chlorophyll a, nitrate and phosphate while limited to one season are within the range of values which might be expected for such an estuarine-river system. All the parameters measured indicate that the estuarine area is well mixed.

COM-74-11122/0GA PC$4.00/MF$1.45
University of Southern California, Los Angeles. Allan Hancock Foundation.
MARINE STUDIES OF SAN PEDRO BAY, CALIFORNIA. PART V. DATA REPORT. TEMPERATURE, SALINITY, OXYGEN AND PH IN OUTER LOS ANGELES HARBOR, JUNE 1971 TO NOVEMEBR 1973,
Dorothy F. Soule, and Mikihiko Oguri. Feb 74, 80p USC-SG-3-74 NOAA-74050903
Grant NOAA-043-158-45
See also Part 4, COM-74-11121.

Descriptors: Oceanographic data, *San Pedro Bay, *Water quality, Tables(Data), California, Temperature, Salinity, Oxygen, pH, Harbors.
Identifiers: Sea Grant program, Water temperature.

This is the fifth in a series of marine studies of San Pedro Bay, California. It contains tabulated data on temperature, salinity, oxygen, and pH taken in Outer Los Angeles Harbor, June 1971 - November 1973. Graphs are included showing minima and maxima of physical water quality parameters.

COM-74-50489/5GA PC-GPO/MF$1.45-NTIS
National Oceanic and Atmospheric Administration, Boulder, Colo. Office of the Director (ERL).
THE ENVIRONMENTAL IMPACT OF DEEP-SEA MINING.
Technical progress rept.,
O. A. Roels, A. F. Amos, O. R. Anderson, C. Garside, and K. C. Haines. May 73, 186p NOAA-TR-ERL-290, OD-11 NOAA-74041601
Prepared in cooperation with City Univ. of New York, N.Y. Inst. of Oceanography, Grant NOAA-043-022-14. Contrib-25.
Paper copy available from GPO $2.10 as C55.13: ERL-290-OD-11.

Descriptors: *Ocean bottom, *Oceanographic surveys, *Environmental surveys, Phytoplankton, Benthos, Marine biology, Sea water, Chemical composition, Dredging, Manganese nodules, Sediments, Salinity, Pacific ocean, Marine geology.
Identifiers: *Underwater mining, Environmental impacts.

The report gives a literature review of the known physical, chemical, and biological properties of the sea floor and the water column in the areas of the Pacific Ocean where manganese-nodule deposits of interest to the mining industry occur. The report contains the results of a baseline study of the physical, chemical, and biological characteristics of a manganese-nodule province on the Bermuda Rise in the Atlantic Ocean and of a potentially valuable manganese-nodule mining area in the eastern equatorial Pacific. The results of our monitoring of a continuous-line bucket dredge manganese-nodule mining test in the Pacific Ocean are also reported. A detailed plan of work for a 3-year period to ensure the environmental safety of deep-sea mining is outlined. (Modified author abstract)

8K. Seismology

AD-779 814/3GA PC$3.00/MF$1.45
Lamont-Doherty Geological Observatory Palisades N Y
THEORY AND CALCULATION FOR DISPLACEMENTS AND STRESSES AT AN EARTHQUAKE SOURCE.
Semi-annual rept. no. 1,
Paul G. Richards. 30 Apr 74, 18p AFOSR-TR-74-0803
Contract F44620-74-C-0029, ARPA Order-1827

Descriptors: *Earthquakes, *Ground motion, Integral equations, Displacement, Patterns, Rupture, Faults(Geology), Cracks, Stresses, Surface waves.
Identifiers: Seismic discrimination.

The progress report describes the method of calculation of ground motions near an earthquake source, and outlines the research which has led to ten-fold improvements over the previous computational methods. It is shown that surface waves are likely to contribute strongly to near-source ground-motions. A scalar problem is described, in terms of which one may better appreciate the essential difficulties of relating dislocation and traction on a rupturing fault surface. (Author)

AD-779 853/1GA PC$3.25/MF$1.45
Teledyne Geotech Alexandria Va Seismic Data Analysis Center
A STUDY OF PRINCIPAL COMPONENT ANALYSIS AS APPLIED TO SEPARATION OF MULTIPLE PLANE WAVES.
Technical rept.,
Z. A. Der, and E. A. Flinn. 21 Mar 74, 40p Rept no. SDAC-TR-74-2
Contract F08606-74-C-0006, ARPA Order-1620

Descriptors: *Signal processing, *Seismic waves, Frequency, Power spectra, Matrices(Mathematics), Plane waves, Seismic detection.
Identifiers: Eigenvalues, Maximum likelihood estimation, Seismic discrimination.

Principal component analysis, eigenvalue-eigenvector decomposition of array spectral matrices, has been proposed by several authors a a technique for the separation of the signal components of mixed signals observed at an array since the eigenvectors of the spectral matrix often resemble signal delay vectors. This report is a critical evaluation of the method. (Modified author abstract)

AD-779 930/7GA PC$5.50/MF$1.45
Communications Satellite Corp Washington D C
ALTERNATE APPROACHES FOR RETURNING SEISMIC DATA FROM WITHIN THE WORLD-WIDE SEISMOLOGICAL NETWORK TO SDAC.
Final rept. 15 Jan-21 Dec 73,
Jorge Fuenzalida. 1 Apr 74, 48p AFOSR-TR-74-0863
Contract F44620-73-C-0025, ARPA Order-2298

Descriptors: *Seismological stations, *Data transmission systems, Communication satellites, Norway, Iran, South Korea, Virginia.
Identifiers: NORSAR(NORwegian Seismic ARray), Norwegian seismic array.

The report presents recommended system configurations for returning seismic data from seismological research stations in Norway (NORSAR), Iran, and Korea to the Seismic Data Analysis Center (SDAC) in Alexandria, Va. The data are to be returned through INTELSAT earth stations in Sweden, Iran, Korea, and U.S., via INTELSAT satellites located over the Atlantic and Pacific Oceans. Three system approaches were considered, viz, (1) use of terrestrial microwave systems from the seismic station to the INTELSAT earth station, and subsequent transmission to the satellite on a standard FM carrier; (2) construction of a non-standard earth station at the seismic site for direct access to the satellite using single channel per carrier (SCPC) or SPADE transmission techniques; and (3) the possible use of packet-switching technology by extending the ARPANET to those countries where the seismic sites are located. (Modified author abstract)

AD-779 939/8GA PC$4.50/MF$1.45
California Inst of Tech Pasadena Seismological Lab
SEISMOLOGY AND ACOUSTIC-GRAVITY WAVES.
Semi-annual technical rept. 1 Jul 72-31 Dec 73,
David G. Harkrider. 31 Dec 73, 109p AFOSR-TR-74-0797
Contract F44620-70-C-0120, ARPA Order-846

Descriptors: *Earthquakes, *Faults(Geology), Mathematical models, Surface waves, Seismic waves, Displacement, Dislocations.
Identifiers: Alaska earthquake(1964), Finite element analysis, Acoustic gravity waves.

The report deals with the development of a systematic approach of determining the dislocation or relative displacement on the fault surface from a limited set of observed surface displacement data with their estimated errors. The technique gives not only a best fit dislocation model but allows one to determine the reliability of the model and the resolving power of the data set. The resulting dislocation model can then be used to extrapolate the surface displacements outside of the data set. The report also deals with the applications of the inversion technique to the change in surface displacement data caused by deformation resulting from the 1964 Alaska earthquake. For this earthquake, a two-dimensional finite element numerical model is used to calculate surface displacements from a dislocation imposed on a fault surface located in a heterogeneous medium.

AD-780 169/9GA PC$8.25/MF$1.45
California Inst of Tech Pasadena Seismological Lab
SEISMOLOGY AND ACOUSTIC-GRAVITY WAVES.
Final rept. 1 Jan-30 Jun 73,
David G. Harkrider. 1973, 104p AFOSR-TR-74-0862
Contract F44620-70-C-0120, ARPA Order-846
See also report dated 31 Dec 73, AD-779 939.

Descriptors: *Gravity waves, *Underground explosions, *Airburst, *Earthquakes, Rayleigh waves, Microbarometric waves, Propagation, Seismic detection.
Identifiers: *Acoustic gravity waves, San Fernando earthquake, Alaska earthquake.

Previous semi-annual technical reports under this contract have dealt with the generation of acoustic-gravity waves and Rayleigh waves by explosive sources. Section II of this final report is a review and evaluation of source and linear propagation theory of acoustic-gravity waves. The discussion is limited to the literature involving acoustic-gravity waves which travel in the lower atmosphere and to solutions not involving finite difference and finite element techniques. In Section III, the static displacement data obtained for the 1971 San Fernando, California, earthquake are used to try to determine the faulting mechanism for that event. The forward problem is solved using a three-dimensional dislocation theory applicable to a homogeneous half-space.

AD-780 475/0GA Reprint
California Inst of Tech Pasadena Seismological Lab
ON THE STRUCTURE OF THE LOW VELOCITY ZONE,
Donald V. Helmberger. 26 Feb 73, 16p Rept no. Contrib-2321 AFOSR-TR-74-0856
Contract F44620-72-C-0078, ARPA Order-1827
Availability: Pub. in Geophysical Jnl. of the Royal Astronomical Society, v34 p251-263 1973.

Descriptors: *Earth mantle, *Seismic waves, Nuclear explosions, Surface waves, Earth models.

Body wave observations from large nuclear explosions at the Nevada Test Site have been used to model the P-velocity and Q structure along the top of the mantle. The amplitudes of short period

waves in the range 1-4 degrees and 12-35 degrees indicate substantial absorption in the low velocity zone with Q(alpha) of the order of 50. With the source treated as a known quantity, the author used the amplitude ratio of short to long period motion as a criterion in modelling structure. The Cagniard-de Hoop technique is used to compute synthetic seismograms for proposed models. The model obtained has a high velocity lid above a thin pronounced low velocity layer with a small positive gradient existing to depths of 220 km. The shadow zone boundary occurs near 12 degrees. (Author)

ANL/ES-40(Vol.7) PC$4.00/MF$1.45
Argonne National Lab., Ill. (Usa).
ENVIRONMENTAL STATUS OF THE LAKE MICHIGAN REGION. VOLUME 7. EARTHQUAKE HISTORY AND MEASUREMENT WITH APPLICATION TO THE LAKE MICHIGAN DRAINAGE BASIN.
R. B. Keener. Feb 74, 18p
Contract W-31-109-eng-38

Descriptors: (*Lake michigan, Earthquakes), (*Earthquakes, *Seismic detection), Canada, Data, Illinois, Indiana, Michigan, Ohio, Seismology, Wisconsin.

For abstract, see NSA 29 12, number 29396.

8L. Snow, Ice, and Permafrost

AD-780 463/6GA PC$3.75/MF$1.45
Mcgill Univ Montreal (Quebec) Dept of Physics
STUDIES ON THE ELECTRICAL PROPERTIES OF SALINE ICE.
Final rept.,
J. R. Addison, P. Stalinski, and E. R. Pounder. 28 Feb 74, 74p
Contract N00014-70-C-0312

Descriptors: *Sea ice, Electrical properties, Measuring instruments, Capacitance bridges, Ultrasonic tests, Microwave frequency, Experimental design, Canada.

Contents:
An internal modification to extend the conductance ranges of the General Radio Co. Type 1615-A capacitance bridge;
Electrical properties of saline ice at 1 Khz, down to -150C;
An experimental programme for the measurement of THE ELECTRICAL PROPERTIES OF artificial sea ice at UHF and microwave frequencies.

E74-10502 PC$8.25/MF$1.45
Environmental Research and Technology, Inc., Lexington, Mass.
THE APPLICATION OF ERTS IMAGERY TO MONITORING ARCTIC SEA ICE.
Final rept. 28 Jun 72-31 Dec 73,
James C. Barnes, and Clinton J. Bowley. Feb 74, 103p ERT-P-408-F NASA-CR-136907
Contract NAS5-21802
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Ice mapping, Sea ice, Arctic regions, Bering Sea, Beaufort Sea(North America), Greenland, Canada, Earth resources program, Ice reporting, Photointerpretation.

The author has identified the following significant results. Because of the effect of sea ice on the heat balance of the Arctic and because of the expanding economic interest in arctic oil and minerals, extensive monitoring and further study of sea ice is required. The application of ERTS data for mapping ice is evaluated for several arctic areas, including the Bering Sea, the eastern Beaufort Sea, parts of the Canadian Archipelago, and the Greenland Sea. Interpretive techniques are discussed, and the scales and types of ice features that can be detected are described. For the Bering Sea, a sample of ERTS-1 imagery is compared with visual ice reports and aerial photography from the NASA CV-990 aircraft. The results of the investigation demonstrate that ERTS-1 imagery has substantial practical application for monitoring arctic sea ice. Ice features as small as 80-100 m in width can be detected, and the combined use of the visible and near-IR imagery is a powerful tool for identifying ice types. Sequential ERTS-1 observations at high latitudes enable ice deformations and movements to be mapped. Ice conditions in the Bering Sea during early March depicted in ERTS-1 images are in close agreement with aerial ice observations and photographs.

PB-232 903/5GA PC$6.00/MF$1.45
Earth Satellite Corp., Washington, D.C.
SNOW MAPPING AND RUNOFF FORECASTING: EXAMINATION OF ERTS-1 CAPABILITIES AND POTENTIAL BENEFITS FROM AN OPERATIONAL ERS SYSTEM.
Interim rept.
13 Mar 74, 227p* USGS-DO-74-009
Contract DI-14-08-001-13519

Descriptors: *Snow cover, *Remote sensing, *Snowmelt, *Predictions, Water resources, Natural resources management, Runoff, Flood control, Scientific satellites, Benefit cost analysis.
Identifiers: ERTS-1 satellite.

Within the broad area of water resources management, the case study focused on snow mapping and related snow runoff forecasts, and particularly the potential benefits from use of improved runoff forecasts in reservoir regulation. Estimated benefits were based on a simulation of the impact of the errors in residual runoff forecasts upon determination of flood storage allocation. Benefits arise by avoiding excessive flood storage allocations and the resulting penalty cost in hydropower generation. The upper limit of potential residual runoff benefits are presented.

8M. Soil Mechanics

AD-780 260/6GA PC$6.00/MF$1.45
Edaw Inc San Francisco Calif
SOIL DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 57p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 261.

Descriptors: *Soils, *Michigan, Global communication systems, Extremely low frequency, Sites, Physical properties, Texture, Soil classification, Thickness, Permeability, Maps.
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 284/6GA PC$5.00/MF$1.45
Edaw Inc San Francisco Calif
SOIL DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 40p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 285.

Descriptors: *Soils, *Texas, Global communication systems, Extremely low frequency, Sites, Physical properties, Texture, Soil classification, Thickness, Permeability, Maps.
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geogrphical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

BNWL-1710 PC$4.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
CALCULATION OF SOIL HYDRAULIC CONDUCTIVITY FROM SOIL--WATER RETENTION RELATIONSHIPS.
A. E. Reisenauer. 1973, 53p
Contract AT(45-1)-2130

Descriptors: (*Soils, *Porosity), (*Radioactive wastes, *Waste storage), (*Ground water, *Hydraulics), Computer codes, Hapo, Leaks.

For abstract, see NSA 29 12, number 30185.

ORNL-NSF-EP-67 PC$5.75/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
COMPUTER AUGMENTATION OF SOIL SURVEY. INTERPRETATION FOR REGIONAL PLANNING APPLICATIONS.
C. R. Jr. Meyers, R. C. Durfee, and T. C. Tucker. Apr 74, 51p
Contract W-7405-eng-26

Descriptors: (*Soils, *Data compilation), Computers, Maps, Ornl, Planning, Tennessee, Topography.

For abstract, see NSA 29 12, number 29401.

PB-232 704/7GA PC$5.50/MF$1.45
Geological Survey, Menlo Park, Calif.
MULTI-LINEAR ANALYSIS FOR GROUND MOTION STUDIES OF LAYERED SYSTEMS.
Final rept.,
Albert T. F. Chen, and William B. Joyner. Mar 74, 50p USGS-GD-74-020

Descriptors: *Soil mechanics, Vibration, Stratification, Damping, Digital filters, Numerical analysis.
Identifiers: *Ground motion.

A general model for non-linear stress-strain behavior is defined and incorporated into a numerical method for calculating the response of a horizontally layered system to imposed horizontal base motions. For small assumed values of viscous damping, the computed surface acceleration shows spurious oscillations whose frequency is inversely proportional to the discretization interval in depth. The discretization interval must be chosen small enough so that the frequency of the oscillation is higher than the highest frequency of interest in the problem. The oscillation can easily be removed by digital filtering.

SLA-73-345 PC$6.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
ANNOTATED BIBLIOGRAPHY OF SANDIA LABORATORIES PUBLICATIONS RELATED TO TERRADYNAMICS.
J. L. Colp, W. N. Caudle, and K. L. Romine. Mar 74, 63p
Contract AT(29-1)-789

Descriptors: (*Soils, Pentrometers), (*Rocks, Pentrometers), (*Missiles, Pentrometers), (*Pentrometers, *Bibliographies).

For abstract, see NSA 29 12, number 31659.

TT-72-58007 PC$9.50/MF$1.45
Bureau of Reclamation, Washington, D.C.
STANDARDS FOR DESIGNING SOIL SLOPE STABILITY,
P. P. Eugaev. 1974, 130p
Trans. of mono. Ukazaniyq po Rascetu Ustoyoivosti Zemiyanyh Ostkosov, Leningrad, 1971, pub. by Vsesoyuznyi Nauchno-Issledovatelskii Institut Gidrotekhniki, Leningrad (USSR). Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Soil stabilization, Slopes, Standards, Cohesive soils, Noncohesive soils, Design, Safety, Failure, Construction, Excavation, Foundations, Moisture, Embankments, Translations, USSR.
Identifiers: *Slope stability.

The report discusses standards and classification of soils used in construction. These standards can be used in slope stability applications in both soft and moderately hard soils.

UCRL-51526 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HIGH-PRESSURE MECHANICAL PROPERTIES OF KAYENTA SANDSTONE.
A. G. Duba, A. E. Abey, B. P. Bonner, H. C. Heard, and R. N. Schock. 5 Feb 74, 24p
Contract W-7405-eng-48

Descriptors: (*Colorado, Sandstones), (*Sandstones, *Mechanical properties), Deformation, Materials testing, Nuclear explosions, Pressure dependence, Stresses, Underground explosions.

For abstract, see NSA 29 12, number 29404.

8N. Terrestrial Magnetism

COM-74-11116/2GA PC$3.00/MF$1.45
Coast and Geodetic Survey, Washington, D.C.
MAGNETIC RESULTS, ELLSWORTH HIGHLAND TRAVERSE, AND MCMURDO-TO-POLE TRAVERSE, ANTARCTICA, 1960-1961,
H. Meyers, and A. X. Meyer. 1962, 20p NOAA-74051424
See also PB-167 543.

Descriptors: *Geomagnetism, *Antarctic regions, Tables(Data).

The report contains tabulations of the results of measurements of the earth's magnetic field made on the Ellsworth Highland and McMurdo-to-Pole Traverses that were conducted during the 1960-1961 austral summer. The results presented are the observed values, with instrumental and temperature corrections applied. Corrections for daily variation and transient fluctuations have not been made. To give the reader an indication of the magnetic activity at the time of observation the tables of results include the 3-hour-range indices, K, from the Byrd and South Pole Magnetic Observatories.

COM-74-11117/8GA PC$4.00/MF$1.45
Coast and Geodetic Survey, Washington, D.C.
MAGNETIC RESULTS, SOUTH POLE TRAVERSE, 1962-1963,
D. M. Perkins. 1964, 14p NOAA-74051422
See also issue for 1961-62 (Antarctic), PB-167 543.

Descriptors: *Geomagnetism, *Antarctic regional, Tables(Data).

The report contains tabulations of the results of measurements of the earth's field made on the South Pole Traverse, which was conducted during the 1962-1963 austral summer. This report covers only the results of the measurements of the magnetic vector at the major scientific stations of the traverse. The traverse was about 900 miles long over an ice plain having no major features, and consisted of two basically wedge-shaped courses originating and terminating and terminating at the South Pole. The results presented are the observed values, with instrumental corrections applied. Corrections for daily variation and transient fluctuations have not been applied. The measured components of the magnetic field were declination (D), inclination (I), and total intensity (F). Each of the observed values is listed with the Universal Time of observation.

COM-74-11124/6GA PC$3.00/MF$1.45
Coast and Geodetic Survey, Washington, D.C.
MAGNETIC RESULTS, FILCHNER ICE SHELF TRAVERSE, 1963-1964,
Michael Phelan. 1965, 12p NOAA-74051421

Descriptors: *Geomagnetism, *Antarctic regions, Tables(Data).

The report contains tabulations of the results of measurements of the earth's magnetic field made on the Filchner Ice Shelf Traverse, which was conducted during the 1964-1964 austral summer. This report covers only the results of the measurements of the magnetic field vector. The results presented are the observed values, with instrumental corrections applied. Corrections for daily variation and transient fluctuations have not been applied. The measured components of the magnetic field were declination (D), inclination (I), and total intensity (F). Each of the observed values is listed with the Universal Time of observation.

9. ELECTRONICS AND ELECTRICAL ENGINEERING

9A. Components

AD-779 812/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
PROSPECTS FOR THE APPLICATION OF FERRITES (MAGNITODIELECTRICS) IN ELECTRICAL MACHINES,
A. I. Adamenko, B. A. Troitskii, and A. I. Yakovlev. 18 Apr 74, 8p Rept no. FTD-HT-23-1187-74
Edited trans. of Elektrontekhnika (USSR) n4 p61-62 Apr 73, by Joseph E. Pearson.

Descriptors: *Ferrites, *Electrical equipment, Utilization, Translations, USSR.

Describes progress in the use of ferrites in the USSR.

AD-779 816/8GA PC$4.50/MF$1.45
Rome Air Development Center Griffiss AFB N Y
FAA LIGHTNING PROTECTION STUDY: LIGHTNING SIMULATION TESTS OF COMMUNICATION CABLES.
Final rept. 1 Nov 72-31 Jan 74,
Richard M. Cosel, Andrew W. Revay, Jr., and James Stahmann. Jan 74, 104p FAA-RD-74-71
Contract DOT-FA72WAI-356

Descriptors: *Transmission lines, *Lightning, Communication equipment, Electric cables, Lightning arresters, Test methods, Simulation, Coaxial cables, Telephone lines, Electromagnetic pulses, Transients.

The purpose of the Lightning Protection Study is to determine the degree of susceptibility of the Federal Aviation Administration electronic systems to induced electromagnetic pulse effects due to lightning, and to propose protective devices adequate for low voltage electronic systems. The report covers one phase of the study; the measurement of inducted electromagnetic effects in typical FAA electronic cables under simulated lightning tests. The other study phases are reported in separate reports, namely analytical cable coupling, cable terminal equipment susceptibility levels, and low voltage lightning protection devices. The report consists of four brief chapters on the description of the cables tested, the cable test list plan, the measurements performed, and the results of the testing. Appendices include a brief description of lightning effects and related data, description of the lightning simulation test equipment, a detailed bibliography of simulated lightning cable testing, and the FAA specifications for the cables tested. (Author)

AD-779 822/6GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
VISUAL MAGNITUDE FLUX RATE DENSITY STANDARDS FOR SUNLIGHT INCIDENT ON PHOTOEMISSIVE SURFACES.
Technical note,
Robert Weber. 6 May 74, 25p Rept no. TN-1974-20 ESD-TR-74-171
Contract F19628-73-C-0002

Descriptors: *Photocathodes, *Photoelectric effect, Photons, Flux(Rate), Sunlight, Quantum efficiency.

Based on the spectrum of the 'real' sun, a zero visual magnitude photon flux rate density of 5.00 x 10 to the 10th power p/sq. m-sec is calculated for a bandwidth of 0.300 micrometer to 0.920 micrometer, a range corresponding to the useful responsivity-bandwidths of both S-20 and S-25 photosurfaces. Over this bandwidth, the average quantum efficiencies of the photosurfaces are shown to agree to within 0.1 percent at a value of 7.2 percent. Finally, photon and photoelectron flux rate densities are calculated for sources of varying visual magnitudes and for transmission through one to five standard air masses. (Author)

AD-779 896/0GA PC$3.25/MF$1.45
Royal Aircraft Establishment Farnborough (England)
SMALL TRANSFORMER DESIGN BY COMPUTER.
Technical rept.,
M. D. Palmer. Feb 74, 46p Rept no. RAE-TR-73155 DRIC-BR-39351

Descriptors: *Transformers, Power supplies, Modules(Electronics), Computer applications, Cores, Ferrites, Computer programs, Great Britain.
Identifiers: *Computer aided design.

The overall efficiency of one module in a modular power supply for an ion motor is mainly determined by the individual efficiencies of the power transistors, the output transformer and the bridge rectifier diodes. A computer program was written to investigate transformer design under conditions compatible with the other circuit elements with the aim of obtaining improvements in efficiency and reduction in mass. Transformers produced to the resulting designs had efficiencies in excess of 98% and masses some 25% less than their predecessors.

AD-779 936/4GA PC$3.25/MF$1.45
Stanford Research Inst Menlo Park Calif
LEAKAGE THROUGH CABLE CONNECTORS.
Final rept. 10 May-30 Oct 73,
E. F. Vance, and S. Dairiki. May 74, 36p AFWL-TR-74-44
Contract F29601-69-C-0127

Descriptors: *Electric connectors, *Electromagnetic shielding, *Transmission lines, *Multiconductor cables, Models, Leakage(Electrical), Test methods.

A qualitative model of shielded connectors for multiconductor cables is described. The model contains a series resistance across the connector and iris coupling through cracks or slits in the connector. The connector model is applied to a matrix description of a multiconductor transmission line.

The results of transfer-impedance measurements on six cable connectors are described and interpreted. (Author)

AD-780 032/9GA PC$5.00/MF$1.45
Signatron Inc Lexington Mass
ELECTRON DEVICE MODELING.
Interim technical rept. no. 3, 13 Aug-13 Nov 73,
L. Ehrman. Mar 74, 170p RADC-TR-74-68
Contract F30602-73-C-0193
See also AD-776 091.

Descriptors: *Transistors, Field effect transistors, Bipolar transistors, Electromagnetic compatibility, Models, Computerized simulation, Nonlinear systems, Transfer functions, Computer programming, Electronic equipment, Electronics.
Identifiers: Equivalent circuits.

A new technique for computing the nonlinear transfer functions of an interacting cascade of nonlinear networks is discussed, and an example of its use given. Experimentally determined nonlinear parameters of a MOSFET tetrode are given, and an equivalent circuit is shown for the device. The programming of some of the software for deriving the parameters of a charge-control bipolar transistor is presented. (Author)

AD-780 038/6GA PC$5.75/MF$1.45
Kentucky Univ Lexington Dept of Electrical Engineering
COUPLED TRANSMISSION LINES. PART I. THEORY.
Final technical rept.,
Clayton R. Paul. Mar 74, 213p RADC-TR-74-61-Pt-1
Contract F30602-72-C-0418
See also Part 2, AD-780 039.

Descriptors: *Transmission lines, Coupling(Interaction), Electromagnetic interference, Electric cables, Predictions, Equations.

The unintentional coupling of energy between wires in cable bundles which connect electronic subsystems is an important source of interference on aircraft, missiles, and ground systems. In the prediction of intrasystem electromagnetic compatibility in recent years, more reliance is being placed on computed codes and within these codes, models are required for predicting the wire coupled interference. It is the purpose of this report to investigate the prediction of wire-to-wire coupling. Part I introduces the general theories of formulation of equations, solution of the equations and assumptions inherent in these formulations which are common to all transmission line analyses regardless of their areas of application.

AD-780 039/4GA PC$6.00/MF$1.45
Kentucky Univ Lexington Dept of Electrical Engineering
COUPLED TRANSMISSION LINES. PART II. EXPERIMENTAL RESULTS.
Final technical rept.,
Clayton R. Paul. Mar 74, 228p RADC-TR-74-61-Pt-2
Contract F30602-72-C-0418
See also Part 1, AD-780 038.

Descriptors: *Transmission lines, Coupling(Interaction), Electromagnetic interference, Electric cables, Predictions, Experimental data.

The unintentional coupling of energy between wires in cable bundles which connect electronic subsystems is an important source of interference on aircraft, missiles, and ground systems. In the prediction of intrasystem electromagnetic compatibility in recent years, more reliance is being placed on computer codes and within these codes, models are required for predicting the wire coupled interference. It is the purpose of the report to investigate the prediction of wire-to-wire coupling. Part II presents the experimental results. (Author)

AD-780 085/7GA PC$3.25/MF$1.45
Monsanto Research Corp Dayton Ohio Dayton Lab
PLANAR HIGH ENERGY PERMANENT MAGNETS.
Semi-annual rept. 1 Oct 73-28 Feb 74,
M. C. Willson, and R. J. Janowiecki. May 74, 50p ECOM-0112-2-73
Contract DAAB07-73-C-0112
See also AD-771 956.

Descriptors: *Permanent magnets, Cobalt, Magnets, Rare earth compounds, Plasmas(Physics), Electric arcs, Intermetallic compounds, Fabrication, Samarium compounds, Cobalt compounds, Traveling wave tubes.
Identifiers: Samarium intermetallics, Cobalt intermetallics, Plasma spraying.

The purpose of the program is to demonstrate the feasibility of fabricating cobalt-rare earth permanent magnets by the arc plasma spraying process. Property goals for spray-fabricated magnets consisted of a coercive force of 6000 oersteds and an energy product of 8 million gauss-oersteds. During this reporting period, magnet samples were fabricated in disk and tube shapes mostly using a spray powder of nominal composition 37.2 wt.% Sm-Co. Magnetic properties of sprayed magnets were enhanced by post-spray heat treatment and aging. Conventional and novel heat treatment methods were investigated. Second and third quadrant demagnetization curves were obtained. Density, microstructure, crystallographic orientation, reproducibility and thermal stability were studied. The best magnet produced during this program displayed a coercive force of approximately 5000 oersteds and an energy product of 7.3 million gauss-oersteds. (Author)

AD-780 086/5GA PC$3.25/MF$1.45
ITT Electron Tube Div Easton Pa
REPETITIVE SERIES INTERRUPTER.
Triannual rept. no. 2, 1 Nov 73-28 Feb 74,
Charles L. Shackelford. May 74, 32p ECOM-0320-2-73
Contract DAAB07-73-C-0320
See also report dated Jan 74, AD-773 662.

Descriptors: *Interrupters, Electron tubes, Interactions, Magnetic modulators, Linear systems, Computer programming, Mathematical models.
Identifiers: *Repetitive series interrupters, Computer aided design, Linear interaction tubes.

The objectives of the study are the development of the theory of operation, computer aided design techniques, and operating models of the Interrupter and the magnetic modulator employing the Interrupter. The operating models are to be able to interrupt 200 amperes at 15 kilovolts. They are to provide control of 0.8 ampere direct current. The design approach is an extension of hydrogen thyratron techniques. Design and construction of four devices was undertaken during the period. A study of 10 interaction space coupling arrangements was completed. Circuit redesign and construction was performed. Interruption of 200 amperes at 15 kilovolts was achieved. Interruption of 33 amperes with subsequent permanent hold-off of 10 kilovolts was performed. (Author)

AD-780 101/2GA PC$3.25/MF$1.45
General Electric Co Syracuse N Y Imaging Devices Operation
DEVELOPMENT OF SHORT-WAVELENGTH INFRARED VIDICON.
Final rept. 1 Jun 72-30 Nov 73,
Hans G. Sippach. Feb 74, 33p AFAL-TR-74-9
Contract F33615-72-C-1974

Descriptors: *Camera tubes, *Vidicons, Photoconductors, Germanium, Doping, Copper, Photosensitivity, Performance(Engineering), High frequency, Wavelengths.
Identifiers: *Infrared vidicons, Design.

The original scope of the program was the exploratory development of infrared vidicons using nickel(I)-doped germanium cooled to 65K as a photoconductor. The unsuccessful attempts to attain the proper doping of the sensing layer are described and the reasons why the approach was abandoned are given. The scope of program was switched to the improvement of infrared vidicons using copper(II)-doped germanium cooled to 77K as a photoconductor. The preparation of these sensing layers and detailed processing schedules are described. The successful implementation of a reticulation process yielding increased resolution is outlined and its limitations are described. The performance and construction of the tube are discussed and an analysis of the theoretical sensitivity of both the photoconductor and the vidicon is presented. Measured performance data of two tubes fabricated under this contract are given and their performance is compared to the theoretical limit. Recommendations for future work are made. (Author)

AD-780 102/0GA PC$3.25/MF$1.45
General Electric Co Syracuse N Y Imaging Devices Operation
LONG-WAVELENGTH IR VIDICON DEVELOPMENT.
Final technical rept. 1 Feb 72-23 Jul 73,
Hans G. Sippach. May 74, 38p AFAL-TR-74-3
Contract F33615-72-C-1318

Descriptors: *Camera tubes, *Vidicons, Photoconductors, Germanium, Doping, Zinc, Photosensitivity, Performance(Engineering), Long wavelengths.
Identifiers: *Infrared vidicons, Design.

The development of extrinsic infrared camera tubes, using zinc(II)-doped germanium cooled to liquid-helium temperature as a photoconductor, is described. The problems in the growth of the starting material and the preparation of the sensing layers are given. The development and application of a reticulation process yielding increased resolution and thus higher sensitivity for subaperture images, are described and its details outlined. The performance and construction of both the electron optics and the tube envelope are discussed and an analysis of the ultimate performance and limitations of such infrared vidicons is presented. Measured performance data on two tubes fabricated under this contract are given and their performance is compared to the theoretical limit. Recommendations for possible future work are made. (Author)

AD-780 160/8GA PC$4.75/MF$1.45
General Electric Co Philadelphia Pa Space Div
THEORETICAL AND EXPERIMENTAL STUDIES OF SEMICONDUCTOR DEVICE DEGRADATION DUE TO HIGH POWER ELECTRICAL TRANSIENTS.
Final technical rept. 6 Mar 72-31 Dec 73,
Dante M. Tasca, Joseph C. Peden, and John L. Andrews. Dec 73, 129p Rept no. 73SD4289
Contract DAAG39-72-C-0066

Descriptors: *Semiconductor devices, *Transient radiation effects, Electromagnetic pulses, Damage assessment, Semiconductor diodes, Transistors, Microcircuits, Metal oxide semiconductors, Failure(Electronics), Waveforms, Mathematical models.
Identifiers: Second breakdown.

The report presents the results of a study to determine the modes and mechanisms of semiconductor component degradation and failure resulting from high electrical stress transient inputs. Principal areas of investigation were the detailed characterization of such degradation and failure mechanisms in selected discrete, bipolar and unipolar devices and integrated circuits when stressed with high current transients in the nanosecond to microsecond time regime and to investigate the correlation of component failure with non-destructive parameter measurements. A

major area of interest was to experimentally show the utility of square wave pulsed-power damage testing in the prediction of semiconductor device response for complex power waveforms typical of electromagnetic pulse (EMP) induced transients, and to develop basic analytical techniques for prediction of complex power waveform response using square wave response data.

AD-780 172/3GA PC$15.00/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
MICROWAVE ACOUSTICS HANDBOOK. VOLUME 1A. SURFACE WAVE VELOCITIES.
Physical sciences research papers,
A. J. Slobodnik, Jr., E. D. Conway, and R. T. Delmonico. 1 Oct 73, 724p* Rept nos. AFCRL-TR-73-0597, AFCRL-PSRP-565
See also Volume 1, AD-868 360.

Descriptors: *Microwave equipment, *Acoustic equipment, Acoustic waves, Surface waves, Wave equations, Piezoelectric materials, Statistical data, Bibliographies, Acoustic velocity.
Identifiers: *Microwave acoustics, *Acoustic surface waves.

Information essential for the design of acoustic surface wave filters, signal processors, and other miniature, low cost, reliable devices for use in communications and electronic sensing is given in this report. Computations of surface wave velocity and electromechanical power flow angle, and estimates of surface wave coupling to interdigital transducers are given for various orientations of the following surface wave substrate materials: Ba2NaNb5O15, Bi12GeO20, CdS, Diamond, Eu3Fe5O15, Gadolinium Gallium Garnet, GaAs, Germanium, InSb, InAs, PbS, LiNbO3, MgO, Quartz, Rutile, Sapphire, Silicon, Spinel, TeO2, YAG, YGaG, YIG, and ZnO. Particular cuts of interest are then chosen for more detailed numerical calculations of mechanical and electrical parameters governing acoustic wave propagation in crystalline media. Similar data is given for common metals. A list of material constants and a bibliography of 520 surface wave papers are also included. (Author)

AD-780 186/3GA PC$3.25/MF$1.45
Lehigh Univ Bethlehem Pa
RADIATION EFFECTS OF MOS GATE INSULATORS.
Final rept. Jul-Dec 73,
Frederick M. Fowkes, Walter E. Kahlke, and Sidney R. Butler. Jan 74, 45p HDL-TR-200-1
Contract DAAG39-73-C-0200

Descriptors: *Metal oxide semiconductors, *Radiation effects, Films, Gates(Circuits), Radiation hardening, Oxides, Ions, Impurities, Transport properties, Silicon dioxide, Silicon, Sodium, Aluminum, Chromium, Gold, Gamma rays.
Identifiers: Ion transport.

Impurity metal ions (sodium, aluminum, chromium, and gold) were diffused (and grown) into oxide films on silicon which were then exposed to 1,000,000 rads of ionizing radiation from a cobalt-60 source. The effects of radiation were observed by chemical analysis (to determine ion transport) and by conductance and capacitance measurements (to determine oxide charge and distribution of surface state density). (Modified author abstract)

AD-780 225/9GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
SUPERCONDUCTING ELF MAGNETIC FIELD SENSORS FOR SUBMARINE COMMUNICATIONS.
Interim rept.,
Stuart A. Wolf, Martin Nisenoff, and John R. Davis. 9 May 74, 15p Rept no. NRL-7720

Descriptors: *Submarine antennas, *Superconductors, Global communication systems, Extremely low frequency, Underwater communications, Magnetic fields, Magnetic detectors, Cryogenics.
Identifiers: SQUID(Superconducting QUantum Interference Devices), Superconducting quantum interference devices, SANGUINE project.

The ferromagnetic-core solenoid used as a trailed antenna for communications reception by submarines has not demonstrated adequate sensitivity to satisfy the performance requirements of deeply submerged submarines receiving ELF transmissions from the planned SANGUINE communications system. It is possible, however, that a superconducting quantum interference device (SQUID) can be adapted to this role and satisfy all requirements of platform depth, speed and maneuverability. The report describes the current status of SQUIDs and presents some laboratory measurements that prove the potential of these devices for ELF communications reception. It also discusses the engineering development that must be pursued in the areas of (a) sensor and electronics dynamic range, (b) sensor orthogonality, and (c) refrigeration systems to make SQUID ELF sensors available as operational receiving antennas. (Author)

AD-780 277/0GA PC$3.75/MF$1.45
United Aircraft Research Labs East Hartford Conn
SPUTTERED THIN FILM RESEARCH.
Semi-annual technical rept. no. 4, 1 Oct 73-30 Apr 74,
Alexander J. Shuskus, D. J. Quinn, E. L. Paradis, J. M. Berak, and D. E. Cullen. May 74, 51p Rept no. UARL-N921337-12
Contract N00014-72-C-0415, ARPA Order-2173
See also report dated Oct 73, AD-769 972.

Descriptors: *Thin films, *Semiconducting films, *Dielectric films, *Sputtering, Laser materials, Amorphous materials, Single crystals, Epitaxial growth, Waveguides, Neodymium compounds, Phosphates, Lanthanum compounds, Gallium compounds, Nitrides, Zinc compounds, Oxides, Tungsten compounds, Gallium arsenides, Substrates, Sapphire, Glass, Magnesium compounds, Aluminum compounds, Spinel.
Identifiers: Reactive sputtering, Optical waveguides, Neodymium phosphates, Lanthanum phosphates, Gallium nitrides, Zinc oxides, Tungsten oxides.

Amorphous films of neodymium ultraphosphate and neodymium lanthanum ultrophosphate have been deposited by r.f. sputtering. Optical waveguide structures were fabricated and scattering losses were measured to be less than one dB/cm. Fluorescence lifetime measurements of Nd sup (3 tau) are presented. Data on growth of single crystal films of gallium nitride and tungsten trioxide by reactive sputtering is given. Reduced scattering losses in optical waveguide structures of zinc oxide grown on sapphire have been effected by reduction of secondary electron bombardment of the substrate during film growth. Data is presented on the effect of magnetic field configuration on suppressing secondary electron bombardment and its effect on film uniformity. (Author)

AD-780 401/6GA Reprint
California Univ Berkeley Electronics Research Lab
ANALYSIS AND DESIGN OF TEMPERATURE STABILIZED SUBSTRATE INTEGRATED CIRCUITS,
Paul R. Gray, Douglas J. Hamilton, and J. Darryl Lieux. 14 Dec 73, 12p AFOSR-TR-74-0843
Contract F44620-71-C-0087
Revision of report dated 3 Oct 73.
Availability: Pub. in IEEE Jnl. of Solid-State Circuits, vSC9 n2 p61-69 Apr 74.

Descriptors: *Integrated circuits, Linear systems, Fabrication, Performance(Engineering).
Identifiers: Design, Performance evaluation, Computer aided design.

A generalized temperature-stabilized substrate integrated circuit system containing heat sources and temperature sensors which are distributed in an arbitrary way in two-dimensions over the surface of the chip is analyzed. A computer-aided technique for optimum placement of these components at the layout stage so as to achieve zero nominal temperature coefficient in the performance parameter of interest is described, and other practical design considerations, such as optimum choice of stabilized chip temperature, are considered. The application of this technique is illustrated with the design of a precision temperature stabilized voltage reference supply. Experimental results from this circuit are presented. (Author)

AD-780 445/3GA PC$3.75/MF$1.45
Rensselaer Polytechnic Inst Troy N Y Mechanics Div
AN ANALYSIS OF INTERMODULATION IN THICKNESS-SHEAR AND TRAPPED ENERGY RESONATORS.
Technical rept.,
H. F. Tiersten. May 74, 53p Rept no. TR-11
Contract N00014-67-A-0117-0007

Descriptors: *Crystal oscillators, *Quartz resonators, Piezoelectricity, Elastic properties, Modulation, Vibration, Numerical analysis.
Identifiers: *Electroelasticity.

Electroelastic equations containing terms up to cubic in the small mechanical displacement field, but no higher than linear in the electric variables, are applied in the analysis of intermodulation in rotated Y-cut quartz oscillators. Both pure thickness-shear vibrators and essentially thickness-shear trapped energy resonators are treated. Lumped parameter representations of the solutions, which are valid in the vicinity of a resonance, are presented for the linear and nonlinear portions of both the pure thickness-shear and trapped energy thickness-shear problems. The influence of the driving and detecting circuitry is included and, in particular, in each case the relation between the intermodulation and driving voltage is obtained. Application of this relation to a number of AT-cut quartz fundamental and third overtone trapped energy resonators yields good agreement with experiment and an estimate of the fourth order elastic constant for the AT-cut. (Modified author abstract)

AD-780 446/1GA PC$3.00/MF$1.45
IBM Thomas J Watson Research Center Yorktown Heights N Y
MAGNETO-OPTIC EFFECTS AT 1.15 MICROMETER IN GD(.5)Y(2.5)GA(1) IRON GARNET THIN FILM WAVEGUIDES.
Quarterly technical rept. no. 3, 1 Aug-31 Oct 73,
Samuel C. Tseng, and Axel R. Reisinger. May 74, 21p
Contract N00014-73-C-0256, ARPA Order-2327
See also report dated Jun 73, AD-763 792.

Descriptors: *Waveguides, *Ferrates, *Magnetooptics, Thin films, Magnetic domains, Garnet, Gadolinium compounds, Yttrium compounds, Gallium compounds.
Identifiers: Optical waveguides, *Galliates, Gadolinium ferrates, Gadolinum galliate, Yttrium ferrates, Yttrium galliates, Magnetic films.

The authors have built an experimental setup which enables them to view the magnetic domains in the film and measure the conversion efficiency simultaneously. Reasonable mode conversion efficiency is obtained, only when the stripe magnetic domains in the film are eliminated along the line of light propagation. The bias field (H(a)) required to annihilate the stripe domain is dependent on the direction of the bias field with respect to the axes of magnetic anisotropy. The annihilation field (H(a)) is found to be maxima, of the order of 50 Oe, at O, plus or minus 60, plus or minus 120 degrees from the easy axis, and minima of the order of 2 Oe at plus or minus 45 degrees from the hard axis. (Modified author abstract)

AD-780 521/1GA PC$3.75/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
ELECTRON BEAM INDUCED DEGRADATION IN EBS DIODES.
Technical note,
William E. Krag. 20 May 74, 58p Rept no. TN-1974-33 ESD-TR-74-210
Contract F19628-73-C-0002

Descriptors: *Diodes(Electron tubes), *Diodes(Semiconductor), Radiation effects, Electron beams, Electron tube targets, Degradation, Semiconductor junctions, Radiation protection.
Identifiers: *Electron beam semiconductor devices.

The report describes the effects of ionizing radiation on oxide-semiconductor structures and, in particular, the effects of electron beams on the characteristics of EBS devices. Several methods of protecting the EBS diodes from the effects of the high energy electron beam are proposed and discussed. Brief mention is made of some experiments which have been performed. (Author)

BDX-613-1062 PC$4.50/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
SOLID STATE CIRCUIT BREAKER. TECHNOLOGICAL SPINOFF REPORT.
E. R. Elmer. Feb 74, 28p
Contract AT(29-1)-613

Descriptors: (*Computer codes, *S codes), (*Circuit breakers, *Design), Electronic circuits.

For abstract, see NSA 29 12, number 31647.

BDX-613-1081 PC$4.00/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
AUTOMATIC TESTING AND HANDLING OF BEAM LEAD TRANSISTORS AND DIODES. TECHNOLOGICAL SPINOFF REPORT.
L. W. Smith, and B. G. Wilson. Mar 74, 16p
Contract AT(29-1)-613

Descriptors: (*Semiconductor devices, *Quality assurance), Automation, Integrated circuits, Microelectronic circuits, Performance testing.

For abstract, see NSA 29 12, number 31648.

BDX-613-1086 PC$4.50/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
PHOTOMULTIPLIER TUBE TESTING AND ANALYSIS. TECHNOLOGICAL SPINOFF REPORT.
J. L. Bowers. Feb 74, 28p
Contract AT(29-1)-613

Descriptors: (*Photomultipliers, *Performance testing), Sensitivity, Temperature dependence.

For abstract, see NSA 29 12, number 31649.

COM-74-11053/7GA PC$10.00/MF$1.45
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
HEAT TRANSFER IN PULSED SUPERCONDUCTING MAGNETS.
Interim rept.,
V. Arp, P. J. Giarratano, R. C. Hess, and M. C. Jones. Jan 74, 138p NBSIR-74-363

Descriptors: *Superconducting magnets, *Heat transfer, Liquid helium, Supercritical flow, Subcritical flow, Cryogenics.

The first section of the report summarizes design problems for the development of advanced superconducting pulse magnets, leading to recommendations for future work, primarily in (1) evaluation of eddy-current, hysteresis, and frictional losses, and (2) transient heat transfer between the superconductor and the helium. Two subsequent sections report measurements of forced convection heat transfer respectively to subcooled liquid helium and to supercritical helium just above the critical pressure.

LA-UR-73-1362 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
LABORATORY TEST APPARATUS FOR A SUPERCONDUCTING DC TRANSMISSION LINE.
T. E. McDonald, E. C. Kerr, and W. J. Trela. 1973, 5p CONF-740108-1

Descriptors: Cryogenics, Direct current, Economics, Laboratory equipment, Los alamos scientific lab, Low temperature, Medium temperature, Performance testing, Planning, Power transmission, Superconductivity, Supercooling, Ultralow temperature, Very low temperature.

For abstract, see NSA 29 12, number 31462.

LA-UR-73-1500 PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
DEVELOPMENT PROJECT FOR A DC SUPERCONDUCTING POWER TRANSMISSION LINE.
T. E. McDonald. 1973, 8p CONF-740410-1

Descriptors: (*Power transmission, *Superconductors), Cost, Cryogenics, Design, Direct current, Electric cables, Optimization, Underground.

For abstract, see NSA 29 12, number 31463.

PAT-APPL-447 029 PC$4.00/MF$1.45
Department of Health, Education, and Welfare, Bethesda, Md. Patent Branch.
ULTRASOUND IMAGING SYSTEM UTILIZING SHAPED ACOUSTIC MATCHING ELEMENTS TO INCREASE THE EFFECTIVE APERTURE OF AN ACOUSTIC TRANSDUCER.
Patent Application,
John E. Jacobs, and Donald A. Peterson. Filed 28 Feb 74, 15p DHEW-G-150-72
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Piezoelectric transducers, *Patent applications, Acoustic detectors, Ultrasonic radiation, Optical images.
Identifiers: *Ultrasonic imaging, Acoustic images.

The patent application describes an ultrasound imaging system of the type having a transducer comprising a piezo-electric plate for receiving acoustic energy transmitted through a liquid coupling medium to thereby form an image. The effective aperture of the peizo-electric plate is markedly increased by providing a plurality of hemispherically shaped matching elements disposed in a grid pattern on the acoustic energy receiving surface of the piezo-electric plate. In the preferred inventive embodiment, the hemispherically shaped matching elements are disposed at a distance within the grid-like pattern approximated by the half-wave thickness of the plate, the matching elements being constructed of a material having an acoustic impedance which is substantially equal to value to the square root of the product of the acoustic impedances of the piezo-electric plate and the liquid coupling medium.

SLA-74-5120 PC$4.00/MF$1.45
Rca Labs., Princeton, N.J. (Usa).
SERIES-STACKED TRAPATT DIODES FOR HIGH-POWER MICROWAVE GENERATION.
S. G. Liu. 1973, 4p
Contract 11-6604

Descriptors: (*Semiconductor diodes, *Design), Efficiency, Ghz range 01-100, Microwave equipment, Oscillators.

For abstract, see NSA 29 12, number 31664.

SLA-74-82 PC$5.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
CONTACT RESISTANCE MEASUREMENT: A DESTRUCTIVE TEST.
R. E. Cuthrell. Mar 74, 38p
Contract AT(29-1)-789

Descriptors: (*Electric contacts, *Performance), (*Switches, Performance).

For abstract, see NSA 29 12, number 31661.

9B. Computers

AD-779 818/4GA PC$3.75/MF$1.45
Mitre Corp Bedford Mass
WORKLOAD DETERMINATION AND REPRESENTATION FOR ON-LINE COMPUTER SYSTEMS.
Technical rept.,
C. G. Crothers. Jan 74, 62p Rept no. MTR-2682 ESD-TR-74-54
Contract F19628-73-C-0001

Descriptors: *Computers, *Work, On line systems, Time sharing, Computerized simulation, Computer programs, FORTRAN.
Identifiers: IBM 370/155 computers, Work capacity, Performance evaluation, Workload.

The paper describes preliminary investigations concerned with workload determination and representation for on-line computer systems. Workloads are described in terms of the work required by users at terminals instead of demands on system resources, thereby avoiding biases due to the specific machine under investigation. Prominent users are identified by accounting data, and their on-line requirements are determined by trace programs, source code frequency counts, and various analytical techniques. Complete on-line test workloads can be described by a set of terminal sessions which are then simulated using the Remote-Terminal Emulator. Experimental work on the MITRE IBM 370/155 is described, and it indicates that actual terminal sessions can be represented by synthetic sessions, thus minimizing the problem of developing and debugging test workloads for each new application. (Author)

AD-779 839/0GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
A SECOND ORDER RUNGE-KUTTA INTEGRATION SUBROUTINE THAT USES A DIFFERENT STEP-SIZE FOR EACH VARIABLE.
Final rept.,
Harold L. Toothman. May 74, 26p Rept nos. NRL-MR-2795, NRL-Computer Bull-37

Descriptors: *Computer programs, *Boundary value problems, *Runge Kutta method, Subroutines, FORTRAN, Numerical integration.
Identifiers: CDC 3800 computers.

The program was written to handle the numerical integration of initial value problems in which the frequency content of the variables differ considerably among themselves. In order to save computer time each variable is integrated with its own step-size so that the derivatives of the slowly changing variables are calculated less frequently than the derivatives of the rapidly changing variables. A second order Runge-Kutta method is used since high accuracy is not required. (Author)

AD-779 841/6GA PC$3.75/MF$1.45
Naval Research Lab Washington D C
AN EDITING ROUTINE FOR FORTRAN PROGRAMS.
Final rept.,
Robert R. Dasenbrock. May 74, 51p* Rept nos. NRL-MR-2805, NRL-Computer Bull-38

Descriptors: *Computer programs, Control sequences, Editing, FORTRAN.
Identifiers: CDC 3800 computers, *Editing routines.

A FORTRAN program has been written that allows CDC-3800 users to perform character string substitutions in FORTRAN programs. Other capabilities include several conditional editing commands and the replacement, insertion, and deletion of specified statements. (Author)

AD-779 884/6GA PC$6.75/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
MEASUREMENT AND MODELING OF PROGRAM BEHAVIOR AND ITS APPLICATIONS,
Holger Opderbeck. Apr 74, 286p* Rept no. UCLA-ENG-7418
Contract N00014-69-A-0200-4027

Descriptors: *Memory devices, *Allocations, *Computer programming, Compilers, Replacement, Faults, Stochastic processes, Algorithms, Theses.
Identifiers: *Paging, Virtual memory, Page fault frequency, Markov processes, Multiprogramming.

The emphasis of the research is on the measurement and modeling of program behavior in a paged memory system. Measurement results are used as a foundation for the study of program behavior. Based on these results, models of program behavior are developed. These models are then used to study the performance of replacement algorithms. A new type of replacement algorithm based on the measured page fault frequency (PFF) is defined and investigated. Next, two new program models, the generalized LRU stack model (GLRUM) and the renewal model, are introduced. Finally, the GLRUM is used for the performance evaluation of multiprogramming systems. Several activation and deactivation policies are defined for the PFF algorithm and investigated via a simulation study. It is shown that the PFF replacement algorithm gives - over a wide range of memory sizes - a better performance than the LRU replacement algorithm for any degree of multiprogramming. (Modified author abstract)

AD-780 129/3GA Reprint
Massachusetts Inst of Tech Cambridge
MULTICOMMODITY THROUGHPUT IN DIGITAL DATA NETWORKS WITH FINITE STORAGE,
John S. Fields. 13 Nov 72, 8p
Contract DAAB01-71-C-0300
Revision of report dated 5 Jun 72.
Availability: Pub. in IEEE Transactions on Communications, p836-842 Jul 73.

Descriptors: *Data processing, *Memory devices, *Network flows, Switching circuits, Queueing theory, Shift registers, Theorems.
Identifiers: *Computer networks.

A model of a digital data message switching network is described. The network permits only finite storage at nodes. Discussed is a routing strategy and storage allocation to maximize throughput between many source-receiver pairs simultaneously. (Author)

AD-780 194/7GA PC$10.75/MF$1.45
Massachusetts Inst of Tech Cambridge Artificial Intelligence Lab
ASSIMILATION OF NEW INFORMATION BY A NATURAL LANGUAGE-UNDERSTANDING SYSTEM.
Technical rept.,
Drew Vincent McDermott. Feb 74, 154p Rept no. AI-TR-291
Contract N00014-70-A-0362-0003

Descriptors: *Natural language, *Computer programming, *Artificial intelligence, Syntax, Learning machines, Mathematical logic, Reasoning, Problem solving, Theses.
Identifiers: TOPLE computer program, Predicate calculus.

The report describes a program, called TOPLE, which uses a procedural model of the world to understand simple declarative sentences. It accepts sentences in a modified predicate calculus symbolism and uses plausible reasoning to visualize scenes, resolve ambiguous pronoun and noun phrase references, explain events, and make conditional predictions. Because it does plausible deduction, with tentative conclusions, it must contain a formalism for describing its reasons for its conclusions and what the alternatives are. When an inconsistency is detected in its world model, it uses its recorded information to resolve it, one way or another. It uses simulation techniques to make deductions about other creatures' motivation and behavior, assuming they are goal-oriented beings like itself. (Author)

AD-780 227/5GA PC$3.00/MF$1.45
Office of Naval Research, London (England).
COMPUTERS AND THE EEC,
Arthur H. Waynick. 18 Feb 74, 14p ONRL-R-1-74

Descriptors: *Computers, *Computer programs, *Europe, *Market research, Data processing, Economics, Great Britain.

A summarization of a proposed policy for the electronic data processing industry within the European Economic Community is presented. Emphasis is placed on the data which provided the basis for the policy.

AD-780 237/4GA PC$3.75/MF$1.45
Maryland Univ College Park Computer Science Center
A STRUCTURED APPROACH TO THE DESIGN OF GRAAL.
Technical rept.,
Victor R. Basili. Apr 74, 69p Rept no. TR-299
Contract N00014-67-A-0239-0021

Descriptors: *Programming languages, Compilers, Syntax, Semantics, Set theory.
Identifiers: *GRAAL programming language, Design, Structured programming, Graph theory.

The report is an attempt at systematizing a set of ground rules for high-level language design. It recommends the use of a hierarchical semantic model schema, HGL, in a step by step, top-down approach imposing more and more structure on the language components as the design becomes solidified. The approach is demonstrated by showing the stepwise design of the high-level language, GRAAL. The method recommended is divided into three major phases. The first is an informal one. The second is encoding the language components into a very high-level model. This high-level design allows a redesign of language components before they have been specified at too detailed a level. The third phase is to design the compiler in HGL using the final language design. (Author)

AD-780 312/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ON THE APPLICATION OF MATRIX PRINCIPLES WHEN DESIGNING DIGITAL COMPUTERS (TSVM) UTILIZING MULTIVALUE ELEMENTS,
Yu. L. Ivaskiv, and N. N. Bychenok. 24 May 74, 10p Rept no. FTD-HT-23-1022-74
Edited trans. of mono. Mnogoustoichivye Elementy i ikh Primenenie. Sbornik Statei, n.p., 1971 p284-289, by Catherine M. Barber.

Descriptors: *Digital computers, *Memory devices, Matrices(Mathematics), Translations, USSR.
Identifiers: Arithmetic and logic units, Design.

AD-780 353/9GA Not available NTIS
Rand Corp Santa Monica Calif
SOVIET CYBERNETICS REVIEW: VOLUME 2, INDEX 1972,
W. B. Holland. 1972, 24p Rept no. R-960/7
See also report AD-770 323.
Availability: Paper copy available from Publication Dept., RAND Corp., 1700 Main St., Santa Monica, Calif. 90406. Subscription $48.00/year.

Descriptors: *Cybernetics, *USSR, Computer applications, Reviews.

Contents: Subject Index, Personality Index, Organization Index, and Hardware/Software Index.

AD-780 354/7GA Not available NTIS
Mathematisch Centrum Amsterdam (Netherlands) Afdeling Informatica
OPERATIONAL AND MATHEMATICAL SEMANTICS FOR RECURSIVE POLYADIC PROGRAM SCHEMATA (EXTENDED ABSTRACT),
W. P. De Roever. Sep 73, 10p Rept no. IW-6/73
Availability: Pub. from Proceedings of Symposium and Summer School 'Mathematical foundations of Computer Science', 3-8 September 1973, High Tatras, Held in Czechoslovakia, P293-298.

Descriptors: *Programming languages, *Semantics, *Mathematical logic, Recursive functions, Parallel processing, Computations, Set theory, Netherlands.
Identifiers: Schema theory, Axioms.

The language PL for first-order recursive program schemes with call-by-value as parameter mechanism is described using models for sequential and independent parallel computation. The language MU for binary relations over cartesian products which has minimal fixed point operators is defined. An injection between PL and MU is specified together with the conditions subject to which this injection induces a translation. MU is axiomatized using a many-sorted generalization of TARSKI's axioms for binary relations, SCOTT's induction rule and fixed point axiom and new axioms to characterize projection functions, whence by the translation result a calculus for first-order program schemes is obtained. (Author)

AD-780 407/3GA PC$4.75/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
AN EXPERIMENTAL ANALYSIS OF PROGRAM REFERENCE PATTERNS IN THE MULTICS VIRTUAL MEMORY.
Interim scientific rept.,
Bernard S. Greenberg. May 74, 142p* Rept no. MAC-TR-127
Contract N00014-70-A-0362-0006

Descriptors: *Memory devices, Rates, Computer programming, Real time, Faults, Queueing theory, Scheduling, Algorithms, Theses.
Identifiers: *Paging, Virtual memory, MULTICS system, Computer storage management, MAC project.

The report discusses the design, conducting, and results of an experiment intended to measure the paging rate of a virtual memory computer system as a function of paging memory size. This experiment, conducted on the Multics computer system at M.I.T., a large interactive computer utility serving an academic community, sought to predict paging rates for paging memory sizes larger than the existent memory at the time. A trace of all secondary memory references for two days was accumulated, and simulation techniques applicable to 'stack' type paging algorithms (of which the least-recently-used discipline used by Multics is one) were applied to it. A technique for interfacing such an experiment to an operative computer utility in such a way that adequate data can be gathered reliably and without degrading system performance is described. (Modified author abstract)

AD-780 408/1GA PC$6.50/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac

ANALYSIS OF ALGORITHM IMPLEMENTATIONS.
Interim scientific rept.,
Gregory R. Ruth. May 74, 268p Rept no. MAC-TR-130
Contract N00014-70-A-0362-0006

Descriptors: *Computer programming, Errors, Computer aided instruction, Interfaces, Artificial intelligence, Synthesis, Algorithms.
Identifiers: MAC project, *Computer program verification, Error analysis.

It is shown that the intelligent analysis of algorithm implementations can be systematized and automated. A method is developed by which the correctness or near correctness of a program written to carry out a task according to known general plans can be systematically deduced. Emphasis is placed on understanding the workings of the program under analysis so that errors may be located, characterized and explained in programming terms. Analysis consists of discovering the underlying plan of a program and interpreting it as a variation of the known algorithms for performing the program's task. Knowledge of how intentions are translated into programs facilitates equivalence determination. The inclusion of common errors as intention implementations makes this, and thus understanding possible even in the case of faulty programs. (Modified author abstract)

AD-780 411/5GA PC$3.00/MF$1.45
Maryland Univ College Park Computer Science Center
A NOTE ON CYCLE GRAMMARS.
Technical rept.,
Azriel Rosenfeld. Apr 74, 10p Rept no. TR-300
Contract N00014-67-A-0239-0012

Descriptors: *Programming languages, *Grammars, Context sensitive grammars, Pattern recognition, Artificial intelligence.
Identifiers: Automata theory.

Grammars whose languages consist of cycles (necklaces) rather than strings are considered. If G is context free, and if one regards G as generating cycles instead of strings, the resulting language is just what one would get if he bent the strings of L(G) into cycles. This is no longer true if G is context sensitive. However, in this case too, the context-sensitive cycle languages are just the bendings of the context-sensitive string languages. Automata on cyclic tapes are also discussed.

AD-780 412/3GA PC$3.25/MF$1.45
Maryland Univ College Park Computer Science Center
EXTENDED CONTROLLED TABLE ARRAYS.
Technical rept.,
Rani Siromoney, and Gift Siromoney. May 74, 33p Rept no. TR-304
Contract N00014-67-A-0239-0012

Descriptors: *Programming languages, *Grammars, Parallel processing, Pattern recognition, Arrays.
Identifiers: Automata theory.

A generative 2-dimensional rectangular array model which allows for growth only along the edges is proposed. The growth takes place in parallel, restricted by tables, and growth along the four different edges is controlled by a control set. A special class of these models includes 2-dimensional developmental systems; the hierarchy within this class is studied. The generative power of the new model is compared with that of earlier array models.

AD-780 436/2GA PC$4.50/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
THE COMPUTER UTILITY AS A MARKETPLACE FOR COMPUTER SERVICES.
Interim scientific rept.,
Robert M. Frankston. May 74, 102p* Rept no. MAC-TR-128
Contract N00014-70-A-0362-0006

Descriptors: *Computers, *Computer applications, *Problem solving, *Market research, Consumers, Utilization, Time sharing, Finance, Accounting, Allocations, Theses.
Identifiers: MAC project, Computer networks, MULTICS system.

Computers are unique in their ability to be programmed for a wide variety of applications. Because of its flexibility, a computer system can support, concurrently, many services that do not require dedicated hardware. Conversely, these services act to bring the capabilities of the computer to the consumer who might otherwise find the operational difficulty of running computer programs too formidable. Since the computer is supporting many services which are sold to the consumers, it is natural to model the system as a marketplace. The requirements of such a marketplace are not satisfied in contemporary computer systems. However, the marketplace can be evolved from some existing computer system without fundamental changes. Presently the user of a computer requires considerable expertise on the part of the user. The evolution to marketplace is necessary if the capabilities of the computer systems are to be made more widely available than they are now. (Modified author abstract)

AD-780 452/9GA PC$3.25/MF$1.45
Stanford Univ Calif Dept of Computer Science
GEOMED: GEOMETRIC EDITOR.
Technical rept.,
Bruce G. Baumgart. May 74, 48p* Rept nos. STAN-CS-74-414, AIM-232
Contract DAHC15-73-C-0435, ARPA Order-2495
Report on Stanford Artificial Intelligence Project.

Descriptors: *Computer programming, *Interactive graphics, Three dimensional, Geometry, Plotting, Control sequences.
Identifiers: GEOMED computer program.

GEOMED is a system for doing 3-D geometric modeling; used from a keyboard, it is an interactive drawing program; used as a package of SAIL or LISP accessible subroutines, it is a graphics language. With GEOMED, arbitrary polyhedra can be constructed; moved about and viewed in perspective with hidden lines eliminated. In addition to polyhedra; camera and image models are provided so that simulators relevant to computer vision, problem solving, and animation may be constructed. (Author)

AD-780 527/8GA PC$3.25/MF$1.45
Aeronautical Systems Div Wright-Patterson AFB Ohio
AN INTERACTIVE POLYNOMIAL MANIPULATION PROGRAM.
Final rept.,
Henry J. McGlynn, Jr. Jan 74, 50p Rept no. ASD-TR-74-1

Descriptors: *Polynomials, *Transfer functions, *Computer programs, Computer programming, Computations, Flight control systems.
Identifiers: CDC 6600 computers, IBM 360 computers, POLOPS computer program.

The report serves as a user's guide for a teletype-interactive polynomial manipulation program called POLOPS (for polynomial operations). The program was primarily developed as a tool to assist the control system analyst in the manipulation of transfer function polynomials. The program, however, is of a general nature and is not restricted to control system applications. The program was designed for use on the CDC 6600 INTERCOM system at Wright-Patterson Air Force Base. However, American Standards Association FORTRAN and the more restrictive alphanumeric word lengths of the IBM 360 have been used. A complete program listing is presented in Appendix 3.

AD-780 528/6GA PC$3.00/MF$1.45
Mitre Corp Mclean Va
SECURE COMPUTER SYSTEMS: A REFINEMENT OF THE MATHEMATICAL MODEL.
Technical rept.,
D. Elliott Bell. Apr 74, 76p Rept no. MTR-2547-Vol03 ESD-TR-73-278-Vol-3
Contract F19628-73-C-0001
See also Volume 2, AD-771 543.

Descriptors: *Computer programming, *Data processing security, Mathematical models, Mathematical logic, Computers, Security, Algorithms, Theorems.
Identifiers: *Computer information security, *Computer privacy.

A model developed for the investigation of security in computer systems is refined in three major ways, incorporating an object structure, a notion of current security level, and an altered *-property. In addition, the various ramifications of classifying a control structure are explored. It is shown that security requirements can be fulfilled in a system using these refinements. (Author)

AD-780 529/4GA PC$3.25/MF$1.45
Mitre Corp Bedford Mass
CONCEPT OF OPERATION FOR HANDLING I/O IN A SECURE COMPUTER AT THE AIR FORCE DATA SERVICES CENTER (AFDSC).
E. L. Burke. Apr 74, 40p Rept no. MTR-2733 ESD-TR-74-113
Contract F19628-73-C-0001

Descriptors: *Data processing security, Input output devices, Classified materials, Interfaces, Air Force facilities, Air Force equipment.
Identifiers: MULTICS system, *Computer information security, *Computer privacy.

The operation of a computer system in a secure fashion requires the control of access to all parts of the system. One part of the system which is often neglected when access and security controls are developed is the input/output (I/O) subsystem. This paper develops a general Concept of Operations for I/O in a secure computer system. This concept is then applied to the proposed two-level, Secret-Top Secret, MULTICS System at the Air Force Data Services Center (AFDSC). The most unusual operational feature recommended for the AFDSC MULTICS is the use of autonomous processes to perform all I/O, preventing any user from directly accessing any I/O device. Procedures are described to provide the necessary controls for operation in the Data Services Center environment. (Author)

ANL-8076 PC$5.45/MF$1.45
Argonne National Lab., Ill. (Usa).
COMPUTER-AUTOMATED TOPOLOGICAL NETWORK DESIGN FOR INTEGRATED-CIRCUIT CHASSIS.
W. J. Snow. Feb 74, 140p
Contract W-7405-109-eng-38

Descriptors: (*Integrated circuits, *Design), Algorithms, Computer codes, Computers, Logic circuits.

For abstract, see NSA 29 12, number 31595.

BNL-18733 PC$7.50/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
BROOKHAVEN COMPUTER USER'S GUIDE.
K. Fuchel, S. L. Padwa, A. Scott, and C. Stewart. Jan 74, 90p

Descriptors: (*Bnl, Computers), (*Computers, *Manuals), Cdc computers, Information retrieval, Information systems, Programming.

For abstract, see NSA 29 12, number 31596.

COO-1428-371 PC$3.00/MF$1.45
Purdue Univ., Lafayette, Ind. (Usa).

SCHEDULING MODEL FOR COMPUTER SYSTEMS WITH TWO CLASSES OF PROCESSORS.
R. E. Buten, and V. Y. Shen. 1972, 9p CONF-710832-2

Descriptors: Algorithms, Computers, Management, Process control, Simulation.

For abstract, see NSA 29 12, number 31597.

COO-1469-237 PC$9.50/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
COLFTAR: A REAL-TIME ELECTRO-OPTICAL SYSTEM FOR TWO-DIMENSIONAL FOURIER TRANSFORMS.
D. S. Sand. Dec 73, 127p UIUCDCS-R-73-584
Contract AT(11-1)-1469

Descriptors: Data processing, Fourier transformation, Holography, Image tubes, Laser radiation, Operation, Optical systems, Real time systems, Two-dimensional calculations, Vidicons.

For abstract, see NSA 29 12, number 31651.

COO-2383-2 PC$4.00/MF$1.45
Illinois Univ., Urbana (Usa). Dept. Of Computer Science.
ICGS SYSTEM: SYSTEM TABLES MANUAL.
D. H. Mueller. Feb 74, 18p UIUCDCS-R-74-609
Contract AT(11-1)-2383

Descriptors: (*Computer codes, *I codes), Computers, Data processing, Manuals, Monitoring, Programming.

For abstract, see NSA 29 12, number 31598.

CTC-INF-1083 PC$4.00/MF$1.45
Oak Ridge Gaseous Diffusion Plant, Tenn. (Usa).
IMPACT OF TELECOMMUNICATIONS ON COMPUTER OPERATIONS MANAGEMENT. A TRADE-OFF: EFFICIENCY VS RESPONSIVENESS.
C. L. Allen. 1974, 8p CONF-740405-1

Descriptors: (*Computers, *Management), Communications, Economics, Efficiency, Operation, Telemetry.

For abstract, see NSA 29 12, number 31599.

EUR-5079 PC$4.00/MF$1.45
Commission of the European Communities, Karlsruhe (F.R. Germany). European Inst. For Transuranium Elements.
MANAGEMENT OF BIBLIOGRAPHICAL DATA BY MEANS OF A SMALL COMPUTER.
H. A. Tasman. Jan 74, 13p

Descriptors: Bibliographies, Heat transfer, Ibm computers, Information retrieval, Management, Nuclear fuels, Programming.

For abstract, see NSA 29 12, number 31542.

KFK-1734 PC$4.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Datenverarbeitung in der Technik.
MULTIPLE COPY FILES IN COMPUTER NETWORKS.
E. Holler. Feb 74, 21p

Descriptors: (*Computers, *Information systems), Data, Documentation, Economics, Management.

For abstract, see NSA 29 12, number 31601.

KFK-1898 PC$4.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Reaktorbauelemente.
DATA LOGGER IN APL-PLUS.
H. J. Ziegler. Feb 74, 26p
In German.

Descriptors: (*Computer codes, *A codes), Data acquisition, Electronic circuits, Personnel.

For abstract, see NSA 29 12, number 31602.

KFKI-74-9 PC$4.50/MF$1.45
Kozponti Fizikai Kutato Intezet, Budapest (Hungary).
SIMULATION OF TIME IN THE CASE OF QUASISYNCHRONOUS DISCRETE EVENT DISTRIBUTIONS.
A. Javor. Feb 74, 25p

Descriptors: (*Computers, *Simulation), (*Data transmission, Simulation), Algorithms, Distribution, Randomness, Time dependence.

For abstract, see NSA 29 12, number 31603.

LA-UR-74-509 PC$4.50/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
APPLICATIONS OF COMPUTER-GENERATED PERSPECTIVE PLOTS.
M. L. Prueitt. 27p CONF-740512-2

Descriptors: (*Computers, *Plotters), (*Computer codes, *P codes), Chemistry, Communications, Diagrams, Errors, Explosions, Geology, Geometry, Magnetic fields, Maps, Mathematics, Personnel, Photons, Shock waves, Topography.

For abstract, see NSA 29 12, number 31605.

ORNL-4946 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ADKWIC: A PL/1 PROGRAM TO PRODUCE KWIC OR KWOC INDEXES FROM ADSEP DATA BASES.
F. D. Hammerling. Mar 74, 21p
Contract W-7405-eng-26

Descriptors: (*Computer codes, *A codes), Information systems, K codes, O codes, Pl-1 language, Programming.

For abstract, see NSA 29 12, number 31606.

PB-232 391/3GA PC$3.25/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. of Computer Science.
ON THE POWER OF MULTIPLICATION IN RANDOM ACCESS MACHINES.
Technical rept.,
Janos Simon. Apr 74, 40p CU-CSD-74-205

Descriptors: *Multiplication, *Parrallel processors, *Computation, Turing machines, Boolean algebra, Polynomials, Computer programming, Theorems.
Identifiers: Computational complexity.

The author considers random access machines with a multiplication operation, having the added capability of computing logical operations on bit vectors in parallel. The contents of a register are considered both as an integer and as a vector of bits and both arithmetic and boolean operations may be used on the same register. It is proved that, counting one operation as a unit of time and considering the machines as acceptors, deterministic and nondeterministic polynomial time acceptable languages are the same, and are exactly the languages recognizable in polynomial tape by a Turing machine. It is observed that the same measure on machines without multiplication is polynomially related to Turing machine time -- thus the power of multiplication on this model characterizes the difference between Turing machine.

PB-232 623/9GA PC$5.00/MF$1.45
Stanford Univ., Calif. Dept. of Electrical Engineering and Computer Science.
EFFICIENT DATA ROUTING SCHEMES FOR ILLIAC IV-TYPE COMPUTERS.
Technical rept.,
Samuel E. Orcutt. Apr 74, 37p STAN-CS-74-429, TR-70
Grant NSF-GJ-41093

Descriptors: *Parallel processors, *Permutations, *Computation, Networks, Circuit interconnections, Computer programming, Routing, Algorithms.
Identifiers: ILLIAC 4 computer.

Much research has recently been done on processor interconnection schemes for parallel computers. These interconnection schemes allow certain permutations to be performed in less than linear time, typically O(log N) or O(square root of N) for a vector of N elements and N processors. In the paper the author shows that many permutations can also be performed in less than linear time on a machine with an ILLIAC 4-type interconnection scheme, that is connections to processors at distances of plus or minus 1 and plus or minus square root of N. These results show that recently developed interconnection schemes yield less speedup over the ILLIAC 4-type interconnections than was thought. These results are of current interest due to the present ILLIAC 4 programming effort.

PB-232 624/7GA PC$4.00/MF$1.45
Stanford Univ., Calif. Dept. of Electrical Engineering and Computer Science.
PERFORMING THE PERFECT SHUFFLE IN AN ARRAY COMPUTER.
Technical note,
Tomas Lang. Oct 73, 19p STAN-CS-74-427, TN-36
Grant NSF-GJ-1180

Descriptors: *Parallel processors, *Computation, *Permutations, Fourier transformation, Networks, Circuit interconnections, Computer programming, Algorithms.
Identifiers: Fast Fourier transform.

The perfect shuffle is an important permutation in parallel processing applications. In the paper, an algorithm is presented for the realization of this permutation on a vector of N=(2 sup n) data points in an array computer with m=(2 sup k) (k<n) memory modules. The interconnection required between modules is a shuffle and a shuffle-exchange network. The algorithm is efficient in the sense that no conflicts occur in the accessing of elements from memory, the indexing is simple and the interconnection network uncomplicated. As an application of the use of this algorithm, the computation of the FFT is considered. In this case, the computation is done as part of the permutation, resulting in an efficient overall procedure. The result of the FFT algorithm is in bit reversed order; to complete the application, an efficient algorithm for the unscrambling in place is also presented.

PB-232 633/8GA PC$4.75/MF$1.45
Stanford Univ., Calif. Dept. of Electrical Engineering and Computer Science.
INTERCONNECTIONS BETWEEN PROCESSORS AND MEMORY MODULES USING THE SHUFFLE-EXCHANGE NETWORK.
Technical rept.,
TomasLang. Oct 73, 31p STAN-CS-74-428, TR-76
Grant NSF-GJ-1180

Descriptors: *Parallel processors, *Networks, *Circuit interconnections, *Permutations, Computation, Computer storage devices, Theorems.
Identifiers: ILLIAC 4 computer.

The shuffle-exchange network is considered as an interconnection network between processors and memory modules in an array computer. Lawrie showed that this network can be used to perform some important permutations in (log of N to the base 2) steps. This work is extended and a network is proposed that permits the realization of any per-

mutation in O(square root of N) shuffle-exchange steps. Additional modifications to the basic procedure are presented that can be applied to perform efficiently some permutations that were not realizable with the original mechanism.

PB-232 789/8GA PC$3.25/MF$1.45
Illinois Univ., Urbana. Dept. of Computer Science.
PL/2D: A PROGRAMMING LANGUAGE FOR GENERATING 2-DIMENSIONAL PATTERNS.
Master's thesis,
Karen Sebela Lantz. May 74, 26p* UIUCDCS-R-74-647
Prepared in cooperation with Alfred P. Sloan Foundation, New York.

Descriptors: *Programming languages, *Recursive routines, Programming manuals, Graphic methods, Education, Theses.
Identifiers: *Pl/2d programming language, Computer graphics.

Pl/2d is a recursive mini-language which produces a graphical output. The languages allow the student to 'see' how recursion works. The motivation for the design was to produce a useful tool that is easy to use and isolates the topic of recursion.

PB-232 860/7GA PC$4.00/MF$1.45
Stanford Univ., Calif. Stanford Electronics Labs.
ASYMPTOTIC REPRESENTATION OF THE AVERAGE NUMBER OF ACTIVE MODULES IN AN N-WAY INTERLEAVED MEMORY.
Technical note no. 41,
Gururaj S. Rao. May 74, 17p SU-SEL-74-033, STAN-CS-74-423
Grant NSF-GJ-41093

Descriptors: *Computer storage devices, Modules, Computation, Gamma function, Queueing theory, Algorithms.
Identifiers: Computer storage management.

In an n-way interleaved memory the effective bandwidth depends on the average number of concurrently active modules. Using a model for the memory which does not permit queueing on busy modules and which assumes an infinite stream of calls on the modules, where the elements in the stream occur with equal probability, the average number is a combinatorial quantity. Hellerman has previously approximated this quantity by (n sup 0.56). It is shown in the paper that the average number is asymptotically equal to square root of ((pi)(n)/2) - 1/3. The method is due to Knuth and expresses the combinatorial quantity in terms of the incomplete gamma function and its derivatives.

PB-232 861/5GA PC$4.75/MF$1.45
Stanford Univ., Calif. Digital Systems Lab.
DYNAMIC MEMORIES WITH FAST RANDOM AND SEQUENTIAL ACCESS.
Technical rept.,
Harold S. Stone. May 74, 35p TN-84
Grant NSF-GJ-41093

Descriptors: *Computer storage devices, Random access computer storage, Logic design, Theorems, Shift registers.
Identifiers: Sequential access storage, Magnetic bubble domains.

The paper treats two dynamic memories, one proposed by Aho and Ullman and the other proposed by Stone. The first memory has the property that every item is accessible in O(log to the base 2 of N) steps, and that after access to the first two items of a block of contiguous items, each successive item can be accessed in unit time. In this paper the author gives a new derivation of the properties, and indicate minor variations and improvements of the memory access algorithm. The second memory as proposed originally has the random-access property but not the sequential-access property. It is shown that for certain sizes of memories, an address recoding exists that exhibits the sequential-access property. Thus the second memory scheme is a possible alternative to the first when both random and sequential access are useful in a dynamic memory.

PB-232 923/3GA PC$4.50/MF$1.45
Colorado Univ., Boulder. Dept. of Electrical Engineering.
JANUS: A UNIVERSAL INTERMEDIATE LANGUAGE.
Interim rept.,
Samuel S. Coleman. May 74, 119p NSF-OCA-GJ32471-J2A
Grant NSF-GJ-32471

Descriptors: *Programming languages, Compilers, Translator routines, Symbolic codes, Assembly languages, Man machine systems, Theses.
Identifiers: *JANUS programming language.

JANUS is an intermediate language used to embody the information which is normally passed from the analysis phase of a compiler to the code generators. By expressing this information in a symbolic form, algorithms can be extracted and implemented on other machines simply by providing code generation procedures; programs coded in a high-level language can be translated to JANUS on one computer, and the resulting output translated to assembly code on another. (A macro processor such as STAGE2 can be used for the second translation.) In the report the authors presents the principles upon which JANUS is based and the syntax of the JANUS language, and show that JANUS is suited to a wide range of source language and target computers.

PB-233 007/4GA PC$5.50/MF$1.45
Illinois Univ., Urbana. Water Resources Center.
CLEOPATRA: COMPREHENSIVE LANGUAGE FOR ELEGANT OPERATING SYSTEM AND TRANSLATOR DESIGN,
Axel T. Schreiner. May 74, 184p* UIUCDCS-R-74-646

Descriptors: *Programming languages, ALGOL, Operating systems(Computers), Compilers, Recursive routines, Mathematical logic, Programming manuals, Theses.
Identifiers: *CLEOPATRA programming language, IBM 360 computers, Structured programming.

CLEOPATRA is a general-purpose and systems implementation language in the style of ALGOL designed for computers similar to the IBM System/360. Among its concepts are extensions to the ALGOL block structure, user-defined data types and data access mechanisms, and user-defined 'generic' operators. The language is goto-free, and has a generalized decision table as its main control structure. An interrupt mechanism is proposed. The report attempts to define an optimal language. It is intended as a user's manual for a prospective implementation.

PB-233 050/4GA PC$3.00/MF$1.45
Human Resources Research Organization, Alexandria, Va.
HARDWARE TECHNOLOGY FOR COMPUTERS IN EDUCATION: ONE OF THE SOLUBLE PROBLEMS.
Professional paper,
Robert J. Seidel. May 74, 12p HumRRO-PP-7-74

Descriptors: *Central processing units, *Operating systems(Computers), *Education, Costs, Decision making, Systems analysis.
Identifiers: *Computer aided instruction.

The paper is a discussion of the state-of-the-art of hardware technology for computers in education. The choices that are available to the user, and the questions the user must ask himself before making a choice of computer hardware are discussed. An example of the costs of a central computer system for educational use is presented.

SLA-73-1029 PC$7.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
DIGITAL COORDINATE TRANSLATOR FOR THE MPS-25 RADAR.
L. H. Minnear. Feb 74, 77p
Contract AT(29-1)-789

Descriptors: (*Translators, *Design), Conversion, Digital circuits, Integrated circuits, Programming, Radar.

For abstract, see NSA 29 12, number 31608.

SLA-73-1038 PC$4.75/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
VISAR DATA REDUCTION.
L. M. Barker. Feb 74, 55p

Descriptors: (*Computer codes, *V codes), Distribution, Impact shock, Interferometers, Interferometry, Laser radiation, Shock waves, Surface properties, Velocity.

For abstract, see NSA 29 12, number 31609.

SLA-73-1078 PC$5.75/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
OPERATION AND MAINTENANCE MANUAL FOR SANDIA IMAGE DIGITIZER.
R. K. Cover. Mar 74, 53p
Contract AT(29-1)-789

Descriptors: (*Digitizers, *Operation), Computers, Data processing, Image scanners, Maintenance, Manuals, Pdp computers.

For abstract, see NSA 29 12, number 31610.

SLA-73-1118 PC$4.75/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
EMR 6130 COMPUTER ON-LINE STATION: CALCOMP 566 X-Y PLOTTER.
C. D. Longerot. Mar 74, 35p
Contract AT(29-1)-789

Descriptors: Computers, Design, Electronic equipment, Equipment interfaces, Real time systems.

For abstract, see NSA 29 12, number 31611.

SLA-73-966 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
TIME CODE DECODER FOR MINICOMPUTERS.
A. F. Veneruso. Mar 74, 26p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *I codes), Computers, Control, Data processing, Design, Electronic circuits, Telemetry, Time interval analyzers, Timing circuits, Timing properties, Transport, Variations.

For abstract, see NSA 29 12, number 31607.

TID-26488 PC$5.45/MF$1.45
Usaec, Washington, D.C.
CAMAC: SERIAL SYSTEM ORGANIZATION.
Dec 73, 67p

Descriptors: (*Camac system, *Specifications), Computers, Control systems, Data transmission, Equipment interfaces.

For abstract, see NSA 29 12, number 29612.

TT-72-58025 PC$10.00/MF$1.45
National Science Foundation, Washington, D.C.
COMPUTER SYSTEMS (COLLECTION OF PAPERS). VOLUME 43, 1971,
U. L. Danilevski, Yu. L. Danilevskii, Yu. D. Bedrin, V. L. Dyatlov, and V. M. Salanskii. 1974, 139p

Trans. of Vychislitelnye Sistemy, Novosibirsk. Sbornik Trudov (USSR) v43 1971. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Thin film storage, Magnetic storage, Permalloys, Magnetic domains, Magnetic permeability, Logic circuits, Translations, USSR.
Identifiers: *Magnetic films.

9D. Information Theory

AD-779 874/7GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
ASYMPTOTIC DISTRIBUTION OF THE DISCRETE TRANSFORM OF A NONUNIFORMLY SAMPLED MULTIDIMENSIONAL PROCESS.
Interim rept.,
David A. Swick. 3 May 74, 20p Rept no. NRL-7711

Descriptors: *Signal processing, *Fourier transformation, Information theory, Stochastic processes, Time series analysis, Matrices(Mathematics), Asymptotic series, Sampling.
Identifiers: Discrete Fourier transform, Fast Fourier transform.

Multidimensional discrete transforms that map arbitrarily spaced sampled data into arrays of coefficients of arbitrary basis functions were considered in a previous paper. These studies are motivated by a model of observations uniformly spaced in time obtained simultaneously at a nonuniform set of spatial points. For the uniformly spaced samples the transformation becomes the familiar discrete finite Fourier transform (DFT), and fast-Fourier-transform processing is applicable. The nonuniformly spaced samples generally require a transformation matrix that is not as highly factorable. For a two-dimensional sample space consisting of M nonuniform spatial points and N uniform temporal points, an efficient transformation is possible if M << N. Under the same assumption this two-dimensional transformation will be shown to approximately diagonalize the covariance matrix. 'Asymptotic' will refer here to the limit as N nears infinity, with M finite.

AD-780 042/8GA PC$4.00/MF$1.45
Illinois Univ Urbana Coordinated Science Lab
ON EFFICIENT MAJORITY LOGIC DECODABLE CODES.
Doctoral thesis,
William Thomas Warren. Apr 74, 98p Rept nos. R-647, UILU-ENG-74-2211
Contracts DAAB07-72-C-0259, F30602-72-C-0031
Sponsored in part by Grant NSF-GK-24879.

Descriptors: *Coding, *Decoding, Information theory, Polynomials, Prime numbers, Matrices(Mathematics), Combinatorial analysis, Theses.
Identifiers: *Majority logic decoding, Geometry codes, Cyclic codes, Block codes.

Majority logic decodable (MLD) codes have been an extremely important class of codes in the past ten years due to their relatively high efficiency and their ease of decoding compared to other classes of codes. In this report the main concern is the thorough investigation of one technique to produce new efficient majority logic decodable codes. A particular code shortening technique is applied to cyclic MLD codes based on a Euclidean geometry, and new interesting MLD codes result.

AD-780 043/6GA PC$3.25/MF$1.45
Illinois Univ Urbana Coordinated Science Lab
AN ERROR-CONTROL SYSTEM BASED ON MAJORITY-LOGIC DECODING,
R. B. Brown, C. L. Chen, R. T. Chien, and S. Ng. Feb 74, 41p Rept nos. R-640, UILU-ENG-74-2203
Contracts DAAB07-72-C-0259, F30602-72-C-0031

Descriptors: *Coding, *Decoding, Error correction codes, Data transmission systems, Shift registers, Parity.
Identifiers: Majority logic decoding, Golay codes, Binary codes, Cyclic codes, Geometry codes.

An investigation was made on the problems in the design and implementation of finite geometry codes. As a result of the investigation, a binary coding system was constructed. Four different error correcting codes are built into the system giving the user a choice of four different coding schemes with different error correcting capabilities. Three of the codes are 1/2-rate codes and the other one is a 1/4-rate code. The codes selected are all majority-logic decodable so that they can be implemented with a reasonable amount of hardware. The newest theory known to-date has been applied in the design of the majority-logic decoder. Each code is interleaved to enable the system to correct both random errors and burst errors.

AD-780 243/2GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
SYMMETRY CODES AND THEIR INVARIANT SUBCODES.
Technical memo.,
Vera Pless. May 74, 17p Rept no. MAC-TM-44
Contract N00014-70-A-0362-0006, ARPA Order-2095

Descriptors: *Coding, Error correction codes, Algebra, Number theory, Invariance, Vector spaces.
Identifiers: MAC project, Golay codes, Symmetry codes.

The paper defines and studies the invariant subcodes, (R sub sigma)(q) and (R sub mu)(q), of the symmetry code C(q) in order to be able to determine the algebraic properties of these codes. Every vector in (R sub sigma)(q) is invariant under a monomial transformation tau, odd order dividing (q + 1), in the group of C(q). Also (R sub mu)(q) is invariant under tau but not vector-wise. The dimensions of (R sub sigma)(q) and (R sub mu)(q) are determined and relations between these subcodes are given. Also (R sub sigma)(q) is shown to be isomorphic to a self-orthogonal subspace of (V sub 3)((2q + 2)/s). The isomorphic images of (R sub sigma)(17) and (R sub sigma)(29) are both demonstrated to be equivalent to the (12,6) Golay code. (Modified author abstract)

9E. Subsystems

AD-779 897/8GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
A DEVICE FOR FORMING PULSES WITH A STEEP FRONT (USTROISTVO DLYA FORMIROVANIYA IMPULSOV S KRUTYM FRONTOM),
I. G. Kataev. 21 May 74, 3p Rept no. NRL-Trans-1293
Trans. of Patent (USSR) 118859, 1959, by Richard S. Relac.

Descriptors: *Electrical networks, *Pulse generators, Pulses, Patents, Delay lines, Translations, USSR.

The patent describes a device for forming pulses with a steep front, which includes an artificial delay line with lumped parameters and which differs in that, for the purpose of increasing the steepness of the pulse front, the elements of the line are capacitors with a ferroelectric and inductance made of ferrites connected by one of the familiar circuits for a delay line.

AD-779 908/3GA PC$3.00/MF$1.45
Watkins-Johnson Co Palo Alto Calif
EBS (ELECTRON BEAM SEMICONDUCTOR) PULSE AMPLIFIER LIFE TEST.
Final engineering rept. 13 Feb 73-28 Jan 74.
28 Jan 74, 18p
Contract N00039-73-C-0052

Descriptors: *Pulse amplifiers, Electron beams, Semiconductor diodes, Electron tube targets, Electron tubes, Life tests.

Highly stable, high voltage, beam shield passivated diodes were fabricated for use in EBS (electron beam semiconductor) grid controlled pulse amplifiers. Six EBS pulse amplifiers were fabricated using these diodes and four of the EBS amplifiers were operated on life test for a total socket time of 14,500 hours. Data is presented showing that stable diode operation was obtained. (Author)

AD-780 027/9GA PC$4.25/MF$1.25
Harry Diamond Labs Washington D C
A SIMPLE GENERATOR OF SEVERAL-HUNDRED-KILOVOLT PULSES WITH NANOSECOND RISE TIMES,
James C. Blackburn, and Ralph D. Genuario. Nov 73, 21p Rept no. HDL-TM-73-24

Descriptors: *Pulse generators, Short pulses, Nondestructive testing, Ceramic materials.

A system for producing rectangular 0.5 MV pulses with rise times of about 1 nsec and duration between 5 and 20 nsec is described. A coaxial line is pulse-charged from a Martin-type autotransformer and then discharged by a fast-rise high pressure switch into a matched CuSO4 load resistor. A low-inductance capacitive voltage divider allows monitoring of the pulse. The jitter and delay in the discharge switch total less than a microsecond, allowing synchronization with other events. The system has been in use for 1-1/2 years with satisfactory results. (Author)

AD-780 031/1GA PC$6.50/MF$1.45
RCA Missile and Surface Radar Div Moorestown N J
HIGH ENERGY HIGH DUTY PULSER.
Final technical rept. Feb 73-Feb 74.
Mar 74, 272p RADC-TR-74-77
Contract F30602-73-C-0151

Descriptors: *Pulse generators, Thyratrons, Hydrogen, High power, Short pulses, Switches, Modulators, Safety.
Identifiers: Design, *Pulsers.

The report presents the results of a one year in-depth study on achieving a high peak energy and high average power pulser. Design objectives are for a 2.5 gigawatt peak power/10 megawatt average power pulser supplying 20 microsecond pulses at 200 pulses per second. An artificial line type modulator with hydrogen thyratron switch tubes was chosen for the pulser design. Emphasis was placed on selection of the type of switching device (hydrogen thyratrons versus spark gaps versus solid state versus mercury pool switches, etc.), and on selection of a particular device of the chosen type. Hydrogen thyratrons were chosen over competing types of switches because suitable types are available 'off the shelf', whereas all of the competing types require some development work to meet the requirements. A sample pulser design, using the KU-275 hydrogen thyratron, is given. (Author)

AD-780 232/5GA PC$3.25/MF$1.45
Ohio State Univ Columbus Electroscience Lab
REFERENCE LOOP PHASE SHIFT IN ADAPTIVE ARRAYS.
Final techical rept.,
D. M. DiCarlo, and R. T. Compton, Jr. May 74, 36p Rept no. ESL-3576-4
Contract N00019-73-C-0195

Descriptors: *Antenna arrays, Adaptive systems, Phase shift circuits, Loops, Interference, Rejection, Signal processing, Control theory, Numerical analysis.

The report discusses adaptive arrays in which the reference signal is derived from the array output.

A particular problem is studied, the problem of reference loop phase shift. It is shown that phase shift in the reference loop causes the array weights to cycle, and also causes the array to frequency modulate the signal. In spite of this frequency change, the array maintains a maximum SNR at the output. (Author)

AD-780 420/6GA PC$3.00/MF$1.45
Naval Training Equipment Center Orlando Fla
AN INVESTIGATION OF THE USE OF MOIRE PATTERNS FOR COMPUTER-GENERATED DISPLAY INSTRUMENT FACES.
Phase rept.,
Jay S. Bolemon. May 74, 16p Rept no. NAVTRAEQUIPC-IH-234

Descriptors: *Display systems, *Moire effects, Instrumentation, Mathematical models.
Identifiers: Computer aided display systems.

Moire patterns are 'interference' patterns created when two closely spaced arrays of lines move relative to each other. This study explored a property of moire patterns, namely the 'beat' produced by interference between arrays producing the pattern. This was used to show apparent motion of an indicator dial to supplement or amplify the dial indication. Thus it would be possible to show a change in direction or a trend of an instrument before the motion was apparent on the dial indicator or on a digital indicator. The moire patterns were generated by a set of programs on the computer-generated display on the NAVTRAEQUIPCEN Computer Laboratory IDIIOM (Information Displays Incorporated Input-Output Machine). (Author)

AD-780 503/9GA PC$7.50/MF$1.45
Microwave Associates Inc Burlington Mass
LOW MICROWAVE FREQUENCY PASSIVE COMPONENTS.
Quarterly status rept. no. 2, 1 Jan-31 Mar 74,
C. Buntschuh, J. Miley, N. Jansen, and R. Williams. 1974, 90p
Contract N00014-74-C-0066

Descriptors: *Integrated circuits, *Microwave equipment, Passive systems, Strip transmission lines, Electronic switches, Diodes(Semiconductor), Modulators, Waveguide couplers, Hybrid systems, Frequency converters.

The objective of the program is the development of several microstripline components and associated TTL compatible integrated circuit control devices where applicable; 3 dB Quadrature hybrid; 20 dB directional coupler; SPDT switch; Voltage controlled amplitude modulator; and frequency translator. The second quarter design and development progress of several microwave integrated circuit components is described. (Modified author abstract)

AD-780 507/0GA PC$3.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
ON IMPROVING APPROXIMATIONS FOR CURRENT AND CHARGE DISTRIBUTIONS OF CYLINDRICAL DIPOLE ANTENNAS.
Physical sciences research papers,
Charles J. Drane, Jr. 18 Dec 73, 31p Rept nos. AFCRL-73-0752, AFCRL-PSRP-579

Descriptors: *Dipole antennas, Cylindrical bodies, Electric current, Electric charge, Approximation, Integral equations.

Approximate formulas are derived for the current and charge distributions on cylindrical dipole antennas. These formulas are distinguished from derivations of some other authors by being better representations, particularly near the ends and driving point of the dipole, and by being valid over a larger range of electrical lengths. The latter distinction is important in the study of single dipoles operated over a fairly broad band of frequencies, or in the normal operation of an array of dipoles of widely varying lengths. A typical array of this kind is the log-periodic dipole antanna. Sample calculations and graphs of current, charge, and admittance are provided for the purpose of comparing the new representations with the earlier derivations and with experimental results. (Author)

AD-780 509/6GA PC$3.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
ON THE LONG CYLINDRICAL ANTENNA.
Physical sciences research papers,
Charles J. Drane, Jr. 8 Feb 74, 31p Rept nos. AFCRL-PSRP-586, AFCRL-TR-74-0080

Descriptors: *Dipole antennas, Cylindrical bodies, Electric current, Electric charge, Approximation.

Approximate solutions are derived for current and charge distributions on center-driven, electrically thin, cylindrical dipole antennas. These solutions apply to electrically long dipoles for which the King-Wu three-term theory is apparently not sufficient, although they are equally useful for the shorter dipoles for which the three-term theory is completely satisfactory. They can apply to cases requiring treatment of a broad range of electrical lengths such as, for example, dipoles driven by pulsed rather than steady-state voltages and log-periodic arrays of dipoles. Current and charge distributions are graphed for ten dipoles whose electrical half-lengths cover the range 0.75(0.25)3.00 times the wavelength. These theoretical results compare favorably with available experimental values. (Author)

PATENT-3 775 119 Not available NTIS
Department of the Air Force Washington D C
PHOTOMECHANICAL METHOD OF PRODUCING GROUNDED PRINTED CIRCUITS.
Patent,
Stuart A. Bemis. Filed 14 Dec 71, patented 27 Nov 73, 7p Rept nos. PAT-APPL-207 901,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Printed circuits, *Photolithography, *Patents, Photomasking, Electrical grounding.
Identifiers: PAT-CL-96-36-2.

The patent describes a photomechanical method of producing a grounded printed circuit utilizes an ungrounded circuit negative, a base film and a diffuser sandwiched therebetween to produce a negative mask having a spread image thereon. This negative mask is used in conjunction with the original ungrounded circuit negative to produce a composite positive which contains the required ground plane and upon which any further terminal grounding can be made. The resultant grounded composite negative is utilized to form the grounded printed circuit.

10. ENERGY CONVERSION (NON-PROPULSIVE)

10A. Conversion Techniques

AD-779 877/0GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
ENERGY FROM THE OCEAN: AN APPRAISAL.
Memorandum rept.,
Owen M. Griffin. May 74, 47p Rept no. NRL-MR-2803

Descriptors: *Energy, Oceans, Solar energy, Tides, Gradients, Heat, Wind, Power, Feasibility studies, Electric power plants.

The oceans and their environment have long been envisioned as renewable sources of energy. It is the purpose of this report to assess the feasibility of drawing on the sea for power and to determine the extent to which the oceans are likely to serve future energy needs. A review is made of proposed U.S. funding levels for the research and development of renewable energy sources during the years 1975 - 1979, and a study is made of the technical and environmental acceptability status of tidal, wind, and sea thermal power generation systems. The estimated costs of these environmental power sources are compared with the prevailing power costs for nuclear and coal plants. On the basis of these comparisons, recommendations are made for a program of research and development, culminating in the construction of prototype plants, for wind and sea thermal power plants. Tidal power generation is found to be technically feasible but economically uninviting at present. (Author)

BNL-18734 PC$4.50/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
SOLAR POWERED STEAM SUPPLEMENT FOR THE BNL STEAM PLANT.
J. G. Cottingham, and G. K. Green. 15 Mar 74, 26p

Descriptors: Air conditioning, Buildings, Conversion, Design, Economics, Heating, Planning, Solar energy, Solar power plants, Steam.

For abstract, see NSA 29 12, number 31450.

COM-74-11102/2GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
ENERGY SUPPLY AND DEMAND AND THE AVAILABILITY OF ENERGY SOURCES. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Jun 74,
Edward J. Lehmann. Jul 74, 167p* NTIS-WIN-74-048

Descriptors: *Energy, *Bibliographies, Supply(Economics), Demand(Economics), Forecasting, Government policies, Sources, Availability, Fuels, Solar energy.

The bibliography contains 159 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The report is divided into two sections. In the first, references are cited which estimate future energy supply and demand and present government energy policies. The second section covers the current and future availability of new and old sources of energy such as petroleum, coal, natural gas, solar, hydrogen, and others.

COM-74-11103/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
SOLAR ENERGY AND WIND POWER. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Jun 74,
Edward J. Lehmann, and Axel C. Ringe. Jul 74, 162p* NTIS-WIN-74-049
Supersedes rept. no. NTIS-WIN-74-016, COM-74-10392.

Descriptors: *Solar power generation, *Solar heating, *Wind power generation, *Bibliographies, Solar generators, Solar cells, Solar energy, Energy storage, Wind(Meteorology), Abstracts.
Identifiers: Energy conversion.

The bibliography contains 154 selected abstracts of research reports retrieved using the NTIS on-line search system--NTISearch. The report is divided into two sections. The section on solar energy contains 100 abstracts dealing with solar heating for buildings, solar electric power generation, solar cells for terrestial use, solar energy as a national resource, and solar stoves. The following 54 abstracts concerning wind power cover such topics as its future, conversion systems, energy storage, propellar design, and its uses. Many of these reports on wind power are recent NASA translations of European and Russian research conducted from 1934 to 1959.

COM-74-11138/6GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
ENERGY CONSERVATION AND WASTE HEAT UTILIZATION. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-Jun 74,
Edward J. Lehmann. Jul 74, 147p* NTIS-WIN-74-051
Supersedes rept. no. NTIS-WIN-74-015, COM-74-10313.

Descriptors: *Energy, *Heat recovery, *Bibliographies, Conservation, Utilization, Heat, Wastes, Fuel consumption, Electric power demand, Electric power plants, Policies, Abstracts, Desalting, Cooling water, Agriculture.
Identifiers: *Waste heat utilization, *Energy conservation, Total energy systems, Water pollution control, Thermal pollution.

The bibliography contains 142 selected abstracts of research reports retrieved using the NTIS online search system--NTISearch. The report is divided into two sections dealing with energy conservation. In the first, 50 reports are presented which concern all aspects of energy conservation including topics such as reducing electricity demand, conservation policies, and the reduction of heating and automotive fuel consumption. The second section covers all aspects of recovering waste heat from power plants, buildings, and industrial water. These 90 reports include studies of total energy systems, waste heat boilers, and the use of power plant waste heat for irrigation, heating, sewage treatment, and desalination.

COO-3326-27 PC$4.00/MF$1.45
Martin Marietta Labs., Baltimore, MD. (Usa).
PROSPECTS OF PHOTOSYNTHETIC ENERGY PRODUCTION.
B. Kok. 1974, 10p CONF-740213-4

Descriptors: Efficiency, Energy conversion, Energy sources, Hydrogen, Methane, Photosynthesis, Plants, Solar energy, Synthetic fuels.

For abstract, see NSA 29 12, number 31457.

LA-UR-74-503 PC$4.25/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
INSTRUMENTATION FOR GRANITE TEST NO. 1.
B. R. Dennis, and R. M. Potter. 1974, 23p CONF-740504-2

Descriptors: (*Geothermal energy, *Measuring instruments), Design, Energy sources, Fractures, Granites, Hydraulics, New mexico, Pressure measurement, Rocks, Volcanoes.

For abstract, see NSA 29 12, number 31465.

LA-UR-74-528 PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
LONG RANGE CONSIDERATIONS AND POSSIBILITIES OF HYDROGEN ECONOMY.
F. J. Edeskuty. 1974, 10p CONF-740119-1
Contract W-7405-eng-36

Descriptors: (*Syathetic fuels, *Economics), Aircraft, Comparative evaluations, Compression, Conversion, Efficiency, Electricity, Electrolysis, Energy storage, Environment, Fuel cells, Fuels, Gasoline, Hydrides, Hydrogen, Internal combustion engines, Liquid fuels, Pollution, Safety, Transport.

For abstract, see NSA 29 12, number 31466.

ORNL-NSF-EP-66 PC$7.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ENERGY CONSERVATION AND THE ENVIRONMENT. PROGRESS REPORT, DECEMBER 31, 1973.
Mar 74, 76p
Contract W-7405-eng-26

Descriptors: (*Coal, *Mining), (*Electricity, *Energy consumption), Abstracts, Buildings, Cost, Energy policy, Energy source conservation, Energy sources, Environment, Food, Land reclamation, Regulatory guides, Research programs, Transport.

For abstract, see NSA 29 12, number 31467.

PB-232 637/9GA PC$5.50/MF$1.45
Hittman Associates, Inc., Columbia, Md.
RESIDENTIAL ENERGY CONSUMPTION, MULTIFAMILY HOUSING.
Final rept.,
Metin Lokmanhekin, and Douglas G. Harvey. Jun 74, 179p* HUD-HAI-4
Contract HUD-H-1654

Descriptors: *Residential buildings, Heating, Heat transfer, Thermal efficiency, Cooling, Cooking devices, Calculations, Electric appliances, Air conditioning, Apartment buildings, Natural gas, Graphics, Thermal insulation, District of Columbia.
Identifiers: *Energy consumption, High rise apartment buildings, Townhouses, Baltimore(Maryland).

Energy utilization of typical multifamily residences (i.e., townhouse, low-rise and high-rise apartments) located in the Baltimore-Washington area were studied in detail, and the results of a parametric study which defines improved energy consuming residences were presented.

SLA-74-124 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SOLAR TOTAL-ENERGY COMMUNITY PROJECT.
G. E. Brandvold. Mar 74, 9p
Contract AT(29-1)-789

Descriptors: Air conditioning, Buildings, Electricity, Energy conversion, Energy sources, Energy storage, Heating, Seasons, Solar collectors, Solar energy, Solar power plants, Total energy systems, Turbines, Variations.

For abstract, see NSA 29 12, number 31476.

SLA-74-194 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
EXPERIMENTAL RESISTIVITY ELECTRODE EMPLACEMENT FOR THE HAWAII GEOTHERMAL PROJECT.
G. E. Brandvold. Apr 74, 8p
Contract AT(29-1)-789

Descriptors: (*Geothermal energy, *Hawaii), Design, Electric conductivity, Electrodes, Energy sources, Geologic deposits, Magnetic probes, Temperature measurement, Viscosity.

For abstract, see NSA 29 12, number 31478.

SLA-74-91 PC$3.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SOLAR COMMUNITY: ENERGY FOR RESIDENTIAL HEATING, COOLING, AND ELECTRIC POWER.
W. H. McCulloch, D. O. Lee, and W. P. Jr. Schimmel. Feb 74, 18p CONF-740213-3
Contract AT(29-1)-789

Descriptors: (*Communities, *Solar energy), Economics, Solar collectors, Solar heating, Solar power plants.

For abstract, see NSA 29 12, number 31475.

UCID-16428 PC$4.75/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
ELEMENTS OF THE WORLD ENERGY CRISIS.
G. C. Werth, and E. Green. 14 Jan 74, 31p
Contract W-7405-eng-48

Descriptors: (*Energy sources, *Availability), Coal, Comparative evaluations, Economics, Energy consumption, Energy reserves, Energy shortages, Energy source conservation, Environment, Europe, Exploration, Geothermal energy, International cooperation, Investment, Japan, Kuwait, Market, Mexico, Mining, Natural gas, Oil shales, Petroleum, Production, Reactors, Saudi arabia, Trade, Usa, Ussr.

For abstract, see NSA 29 12, number 31487.

UCRL-75095 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
THERMOCHEMICAL HYDROGEN PRODUCTION RESEARCH AT LAWRENCE LIVERMORE LABORATORY.
R. G. Hickman, O. H. Krikorian, and W. J. Ramsey. 22 Jan 74, 13p CONF-740306-7

Descriptors: (*Hydrogen, *Production), Chemical reactions, Economics, High temperature, Mercury, Methane, Methanol, Research programs, Selenium, Selenium compounds, Water.

For abstract, see NSA 29 12, number 31489.

10B. Power Sources

COO-2309-1 PC$6.25/MF$1.45
Wisconsin Academy of Sciences, Arts and Letters, Madison (Usa).
ELECTRICAL POWER GENERATION IN WISCONSIN: THE CHALLENGE OF MEETING PRESENT NEEDS AND FUTURE DEMANDS. FINAL REPORT, MARCH 1, 1973--FEBRUARY 28, 1974.
L. R. Lee. 1974, 63p
Contract AT(11-1)-2309

Descriptors: (*Electric power, *Wisconsin), (*Energy sources, Wisconsin), Education, Electricity, Energy consumption, Meetings, Production.

For abstract, see NSA 29 12, number 31456.

ORNL-TM-4422 PC$7.50/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
TEST OF FUSIBLE INSULATION FOR A PROPOSED ISOTOPE POWER UNIT.
M. E. Lackey. Apr 74, 86p
Contract W-7405-eng-26

Descriptors: (*Thermoelectric generators, Thermal insulation), (*Thermal insulation, *Performance testing), (*Strontium 90, Thermoelectric generators), Heat pipes, Titanates.

For abstract, see NSA 29 12, number 29213.

PB-232 668/4GA PC$6.00/MF$1.45
Aerospace Corp., El Segundo, Calif. Civil Programs Div.
SOLAR THERMAL CONVERSION MISSION ANALYSIS. VOLUME I: SUMMARY REPORT.
15 Jan 74, 230p* ATR-74(7417-05)-1-Vol-1 NSF-RA/N-74-017
Contract NSF-C797
Paper copy available in set of 5 reports as PB-232 667-SET, PC$18.00.

Descriptors: *Solar power generation, Electric power plants, Solar heating, Systems analysis, Electric power demand, Insolation, California, Capacity, Economic analysis, Site surveys, Plant location, Environmental engineering, Market research, Forecasting.

The summary report presents principal interim results of Solar Thermal Conversion Mission

Analysis. Results are primarily methodological and are intended to provide an analytical procedure that will consistently evaluate alternative solar thermal conversion concepts in a variety of realistic operating environments. Various sections summarize demand, insolation, margin, mission/system, economic, siting, and environmental methodologies and analyses developed under initial six-month contract. More details are described in four additional volumes. Technical and economic results in this report are preliminary and serve primarily to illustrate the potential capabilities of the methodology itself. (Modified author abstract)

PB-232 669/2GA PC$3.75/MF$1.45
Aerospace Corp., El Segundo, Calif. Civil Programs Div.
SOLAR THERMAL CONVERSION MISSION ANALYSIS. VOLUME II: DEMAND ANALYSIS.
15 Jan 74, 61p ATR-74(7417-05)-1-Vol-2 NSF-RA/N-74-017A
Contract NSF-C797
Paper copy also available in set of 5 reports as PB-232 667-SET, PC$18.00.

Descriptors: *Solar power generation, *Electric power demand, Forecasting, California, Models, Correlation, Weather.

The objectives of the analysis were to develop a methodology capable of characterizing future electric power demand data and to apply this methodology to forecast Southern California hourly electric power demand for the years 1980-2000. Forecasts of demand data exhibiting cyclic variations consistent with observed behavior patterns are necessary inputs to the solar thermal conversion system simulation. The approach used in meeting these objectives consists of several steps. Background information, technical reports and raw data were acquired from governmental agencies and utilities throughout the country and particularly Southern California. A demand model was postulated to include factors describing a growth trend, weather conditions, seasonal influences, and hourly cyclic variations. A correlation between demand and weather, or insolation factors was investigated. A methodology was developed to decompose the time series representing the historic Southern California hourly electric power demand, and to recompose a future demand profile incorporating the historic cyclic variations with a projected trend and statistically varied weather influences.

PB-232 670/0GA PC$4.50/MF$1.45
Aerospace Corp., El Segundo, Calif. Civil Programs Div.
SOLAR THERMAL CONVERSION MISSION ANALYSIS. VOLUME III: SOUTHERN CALIFORNIA INSOLATION CLIMATOLOGY.
15 Jan 74, 119p ATR-74(7417-5)-1-Vol-3 NSF-RA/N-74-017B
Contract NSF-C797
Paper copy also available in set of 5 reports as PB-232 667-SET, PC$18.00.

Descriptors: *Solar power generation, *Insolation, Climatology, Solar radiation, Sky brightness, California, Data processing, Statistical analysis, New Mexico.
Identifiers: Data bases.

An insolation data base consisting of hourly values of normal incidence (direct) insolation and total insolation for a two-year period has been prepared in computer-compatible format for eight stations characterizing Southern California and for Albuquerque, New Mexico. The data base includes, in addition to the insolation data, solar position information, and weather information. When measured insolation values are unavailable, estimated values, obtained by statistical procedures discussed in this report, are inserted so that the insolation data are complete. Some preliminary statistical studies have been performed on these data, including a comparison of insolation at various stations, a percentile frequency analysis of insolation values and a temperature insolation correlation analysis. In addition a literature survey of the information available about the distribution of sky brightness was made. The procedures used and the results of these various studies are discussed in detail in this report.

PB-232 671/8GA PC$5.00/MF$1.45
Aerospace Corp., El Segundo, Calif. Civil Programs Div.
SOLAR THERMAL CONVERSION MISSION ANALYSIS. VOLUME IV: MISSION/SYSTEM AND ECONOMIC ANALYSIS.
15 Jan 74, 158p ATR-74(7417-05)-1-Vol-4 NSF-RA/N-74-017C
Contract NSF-C797
Paper copy also available in set of 5 reports as PB-232 667-SET, PC$18.00.

Descriptors: *Solar power generation, Systems analysis, Economic analysis, Capacity, Electric power plants, California.

The report describes the mission/systems and economic analyses performed to examine the dynamic interaction of insolation, demand, and solar power systems. These analyses used the hourly demand projections and regional insolation data described in the previous volumes. A methodology was developed to parametrically assess the performance characteristics of alternative solar thermal conversion missions and systems in realistic operating environments on a consistent basis. When solar thermal conversion solar power plants are integrated with conventional nuclear and fossil power plants in a total power grid, a margin analysis must be performed to ensure that the integrated system provides equally reliable electric service. Having parametrically determined the technical performance of solar power plants for different modes of operation, a comparative economic evaluation of these alternative power plant concepts and conventional power plants can be made.

PB-232 672/6GA PC$4.00/MF$1.45
Aerospace Corp., El Segundo, Calif. Civil Programs Div.
SOLAR THERMAL CONVERSION MISSION ANALYSIS. VOLUME V: AREA DEFINITION AND SITING ANALYSIS.
15 Jan 74, 77p ATR-74(7417-05)-1-Vol-5 NSF-RA/N-74-017D
Contract NSF-C797
Paper copy also available in set of 5 reports as PB-232 667-SET, PC$18.00.

Descriptors: *Solar power generation, Site surveys, Planning, Electric power plants, California, Plant location, Regional planning, Area.

The document presents the results of an area definition and siting analysis: First, to define and characterize Southern California study region and, second, to identify the area within the region judged to be potentially suitable for siting solar power plants. Boundaries were chose to conform to state boundaries on the west, south, and east and with limits of the Southern California Edison Company service territory on the north. This region contains a wide variety of climatological and geological conditions and is served by three major electrical utilities - Southern California Edison Company, Los Angeles Department of Water and Power, and San Diego Gas and Electric Company. Land area was identified as potentially suitable by the sequential application of technical and institutional exclusion criteria then identifying those locations which were not excluded by any of the criteria. Between 5,000 and 15,000 square miles out of a total of 67,000 square miles were found to be potentially suitable for siting large, central-station solar power plants.

PB-232 883/9GA PC$3.25/MF$1.45
American Cyanamid Co., Stamford, Conn. Chemical Research Div.
RESEARCH ON CADMIUM STANNATE SELECTIVE OPTICAL FILMS FOR SOLAR ENERGY APPLICATIONS.
Quarterly progress rept. no. 1, 1 Jan-31 Mar 74,
G. Haacke. Apr 74, 43p NSF-RA/N-74-031, NSF-RANN/SE/GI-39539/PR/74-1
Grant NSF-GI-39539

Descriptors: *Solar energy, *Optical coatings, *Solar cells, Cadmium inorganic compounds, Stannates, Doping, Electrical resistivity, Hall effect, Carrier density, Optical properties, Cadmium sulfides.
Identifiers: *Cadmium stannates, Radiofrequency sputtering.

The objective of the program is the development of transparent, electically conductive cadmium stannate (Cd2SnO2) coatings and their incorporation into solar energy conversion devices. Technology for the preparation of crystalline Cd2SnO4 films will be sought during the first phase of the program. Subsequently, the electrical and optical properties of these films will be optimized by adjustment of the deposition parameters and by controlled doping. The optical properties of Cd2SnO4 films will be determined and the use of these films evaluated as coatings for flat plate collector covers. Heat collection efficiencies will be measured on assembled flat plate collectors. Cadmium stannate films on transparent substrates will be used as back-wall electrodes in CdS solar cells and the photovoltaic properties of these devices will be investigated.

PB-232 884/7GA PC$3.00/MF$1.45
Stanford Univ., Calif. Dept. of Materials Science and Engineering.
APPLIED RESEARCH ON II-VI COMPOUND MATERIALS FOR HETEROJUNCTION SOLAR CELLS.
Interim quarterly progress rept. no. 1, 1 Feb-31 Mar 74,
Richard H. Bube, Alan L. Fahrenbruch, Fredrik Buch, Kim Mitchell, and Valery Vasilchenko. 15 Apr 74, 25p NSF-RA/N-74-030, NSF-RANN/SE/GI-38445X/PR-74-1
Grant NSF-GI-38445

Descriptors: *Solar cells, *Semiconductor junction, Semiconducting films, Cadmium sulfides, Cadmium tellurides, Zinc tellurides, Zinc selenides, Electrical properties, Photovoltaic effect, Annealing.
Identifiers: Heterojunctions.

Continuing research aimed at developing large-area cells for terrestrial applications the authors have (1) investigated the properties of high resistivity i-layers occurring near the junction interface between the CdS and the CdTe, (2) used thermoelectric power measurements to investigate the electrical transport properties of CdTe films deposited by close-spaced vapor-transport, (3) explored the effect of thermally etching the CdS substrates on the epitaxy of CdTe films, and (4) used H2 anneals to convert high resistivity evaporated CdS films to low restivity (< 1 ohm cm) films. During this period film-crystal cells with solar efficiencies of up to 5.2%, open circuit voltages up to 0.66 V in sunlight, and fill factors of 49% have been produced.

SLA-74-111 PC$4.75/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
DEVELOPMENT OF AN INTERCONNECTION METHOD FOR THE RTG (RADIOISOTOPE THERMOELECTRIC GENERATOR) OUTPUT CIRCUIT.
D. R. Johnson. Apr 74, 34p
Contract AT(29-1)-789

Descriptors: (*Thermoelectric generators, Connectors), (*Connectors, *Fabrication), Aluminium, Electronic circuits, Gold.

For abstract, see NSA 29 12, number 29215.

SLA-74-80 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
ANALYSIS OF FAST RISETIME PULSED THERMOELECTRIC GENERATOR.
E. L. Burgess. Apr 74, 28p
Contract AT(29-1)-789

Descriptors: (*Thermoelectric generators, *Pulse rise time), (*Uranium 235, *Fission), Neutrons, Pulses.

For abstract, see NSA 29 12, number 29214.

10C. Energy Storage

ANL-8039 PC$5.45/MF$1.45
Argonne National Lab., Ill. (Usa).
DEVELOPMENT OF HIGH-SPECIFIC-ENERGY BATTERIES FOR ELECTRIC VEHICLES. PROGRESS REPORT, FEBRUARY 1973--JULY 1973.
P. A. Nelson, E. C. Gay, R. K. Steunenberg, J. E. Battles, and W. W. Schertz. Dec 73, 47p
Contract W-7405-109-eng-38

Descriptors: (*Electric batteries, *Design), Automobiles, Conversion, Electric power, Electrodes, Energy storage, Environment, Halides, High temperature, Lithium, Lithium compounds, Pollution, Sulfur.

For abstract, see NSA 29 12, number 31446.

BNL-18634 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
ENGINEERING-SCALE ENERGY STORAGE RESERVOIR OF IRON TITANIUM HYDRIDE.
G. Strickland, J. J. Reilly, and R. H. Jr. Wiswall. Feb 74, 13p CONF-740306-12

Descriptors: (*Hydrogen, *Storage), Electric power, Electrolysis, Energy storage, Fuel cells, Heat exchangers, Iron compounds, Performance testing, Titanium hydrides, Water.

For abstract, see NSA 29 12, number 31447.

BNL-18725 PC$5.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
OPERATING MANUAL FOR THE PSE AND G HYDROGEN RESERVOIR CONTAINING IRON TITANIUM HYDRIDE.
G. Strickland, and J. J. Reilly. Feb 74, 40p

Descriptors: (*Hydrogen, *Storage), Electric power, Electrolysis, Energy storage, Fuel cells, Heat exchangers, Impurities, Iron compounds, Maintenance, Manuals, Operation, Safety, Titanium hydrides, Water.

For abstract, see NSA 29 12, number 31449.

PATENT-3 770 583 Not available NTIS
Department of the Air Force Washington D C
TWO COMPARTMENTED ELECTROCHEMICAL CELL HAVING ALUMINUM ANODE BUD POWDERED CARBON SUSPENDED IN THE CATHODE COMPARTMENT.
Patent,
George Dana Brabson, Jr., Lowell A. King, David W. Seegmiller, and Armand A. Fannin, Jr. Filed 6 Mar 72, patented 6 Nov 73, 7p Rept nos. PAT-APPL-231 818,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Primary batteries, Carbon, Membranes, Heat treatment, Fused salts, Nonaqueous electrolytes, Aluminum, Electrochemistry, Electrodes.
Identifiers: *Aluminum chlorides, Sodium chloride, *Aluminum chlorine cells, PAT-CL-136-6-LF, *Molten salt electrolytes, *Heat activated batteries.

The invention concerns itself with a heat-activated battery that employs an aluminum electrode and a non-aqueous, fusible electrolyte comprising aluminum chloride saturated with sodium chloride. The entire cell is filled with the electrolyte. It is further divided into two compartments by means of a porous membrane. The first compartment contains an aluminum electrode, while the second compartment contains an inert electrode plus finely divided carbon. The porous membrane permits the free transport of the electrolyte from one compartment to the other.

11. MATERIALS

11A. Adhesives and Seals

AD-780 458/6GA PC$3.75/MF$1.45
Tennessee Univ Knoxville Dept of Chemical and Metallurgical Engineering
A STUDY OF WEAR REACTIONS IN A HIGH-SPEED TEST BETWEEN A NICKEL AND A NICKEL-30 WEIGHT PERCENT CHROMIUM SPECIMEN,
Michael S. Beaton. Feb 74, 72p Rept no. ME-74-T57-18
Contract N00014-68-A-0144
See also AD-762 076.

Descriptors: *Metal seals, Wear, Nickel, Nickel alloys, Chromium alloys, Interfaces, Recrystallization, Electron microscopy, Electronic scanners.
Identifiers: Nickel alloy 30Cr, Scanning electron microscopy.

The study includes systematic surveys of the nickel and Ni-30 Cr wear surfaces using scanning electron microscopy (SEM). Nondispersive x-ray analysis was used in conjunction with SEM to determine the qualitative chemical compositions of various features on the wear surfaces. Optical microscopy was used to examine metallographic samples of the wear track cross-section, and to preview the specimens for location of areas of particular interest.

PATENT-3 329 518 Not available NTIS
Department of Agriculture, Washington, D.C.
PROTEIN GLUE FOR SOUTHERN PINE PLYWOOD.
Patent, *Filed 11 Jun 65, patented 4 Jul 67,
Francis B. Weakley, and Charles L. Mehltretter. 4 Jul 67, 2p PAT-APPL-463 404,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Glue, *Plywood, Blood, Crosslinking, Hot pressing, Sodium silicates, Starches, Borax, Flours(Food), Waterproofing.
Identifiers: PAT-CL-106-157.

The patent concerns hot press adhesives that are particularly effective for forming moisture resistant southern pine plywoods. They are aqueous dispersions containing spray-dried blood, defatted soy flour, dialdehyde starch, sodium silicate, and borax.

11B. Ceramics, Refractories, and Glasses

AD-779 819/2GA PC$3.00/MF$1.45
Iowa State Univ Ames Engineering Research Inst
PROPERTIES OF CERAMIC MATERIALS.
Summary progress rept. no. 24, 1 Sep 72-31 Aug 73,
Thomas D. McGee. Aug 73, 18p Rept no. ISU-ERI-AMES-73210 ARL-74-0083
Contract F33615-68-C-1034

Descriptors: *Ceramic materials, Electrical properties, Creep, Deformation, Sodium chloride, Oxides, Rare earth compounds, Titanium oxides, Cobalt compounds, Nickel compounds, Alumina, Adsorption, Glass, Barium titanates, Piezoelectric materials, Semiconductors, Surface waves.
Identifiers: Neutron activation analysis, Cobalt oxides, Nickel oxides, Acoustic surface waves, Themis project.

The following topics are discussed: Creep in ceramic materials; deformation of sodium chloride; diffusion and strength of ceramic oxide; adsorption isotherm studies; neutron activation analysis; ferroelectric materials; solid electrolytes; acousto-electric device.

AD-779 900/0GA PC$3.75/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
AN EXPERIMENTAL STUDY ON THE COMPRESSIVE BIAXIAL STRENGTH OF CERAMICS.
Annual technical rept. no. 3, 8 Nov 72-9 Jan 74,
George Sines, and Marc Adams. Jan 74, 62p Rept no. UCLA-ENG-7395
Contract N00019-73-C-0294
See also report dated Nov 72, AD-754 826.

Descriptors: *Ceramic materials, *Alumina, Strength(Mechanics), Compressive properties, Compression, Test methods, Failure(Mechanics), Stresses, Brittleness.

To predict the strength under mechanical and thermal loading, and predict the improvement in strength by prestressing or preloading, it is necessary to know the strength under biaxial stresses, and for some thick sections even triaxial stresses. Biaxial stresses state testing was conducted in the compression-compression quadrant. Data was obtained which will allow the determination of the failure envelope in this quadrant. Hopefully, the data will ultimately help establish a comprehensive theory of the biaxial strength of high density, high strength brittle materials such as alumina, silicon carbide, and silicon nitride.

AD-779 901/8GA PC$3.25/MF$1.45
Avco Systems Div Wilmington Mass
SELF-DIFFUSION IN SILICON NITRIDE.
Interim rept. 1 Jan-31 Dec 73,
Bernhardt J. Wuensch, and Thomas Vasilos. Apr 74, 38p
Contract N00014-73-C-0212

Descriptors: *Silicon nitrides, Silicon, Nitrogen, Mass spectrometry, Refractory materials, Tracer studies.
Identifiers: *Self diffusion, *Isotopic labeling.

Progress is described in the first year of a program designed to obtain simultaneous measurement of Si and N self-diffusion coefficients in silicon nitride. Comparative measurements will be made at a given temperature in a variety of materials. Measurements will also be made as a function of temperature for one well characterized material. Neither Si nor N has an isotope suitable for use as a radiotracer. The stable isotopes Si29 and N15 are therefore being used as tracers. Mass spectrometry applied to sections removed serially from a sample will be used to establish isotope distributions. Determination of N15/N14 is being obtained from N2 using gas spectrometry; measurement of Si29/Si30 is being determined from BaSiF6 with hot filament analysis. (Modified author abstract)

AD-779 946/3GA PC$9.00/MF$1.45
Iowa State Univ Ames Engineering Research Inst
PROPERTIES OF CERAMIC MATERIALS.
Summary progress rept. no. 12, 1 Sep 69-31 Aug 70,
Thomas D. McGee. Aug 70, 119p Rept no. ISU-ERI-AMES-84200 ARL-74-0080
Contract F33615-68-C-1034

Descriptors: *Ceramic materials, Electrical properties, Creep, Diffusion, Alumina, Sodium

chloride, Yttrium oxides, Hafnium compounds, Fluorides, Calcium fluorides, Water vapor, Fiberglass, Barium oxides, Calcium oxides, Piezoelectric materials, Semiconductors, Surface waves.
Identifiers: Neutron activation analysis, Hafnium oxides, Themis project, Acoustic surface waves.

The following topics are discussed: Creep in ceramic materials; creep in sodium chloride; adsorption isotherm studies; diffusion and strength of ceramic oxides; activation analysis; barrier layer ferroelectrics; solid electrolytes; acousto-electric devices.

AD-779 947/1GA PC$4.00/MF$1.45
Iowa State Univ Ames Engineering Research Inst
PROJECT THEMIS PROPERTIES OF CERAMIC MATERIALS.
Summary progress rept. no. 16, 1 Sep 70-31 Aug 71,
Thomas D. McGee. Mar 71, 99p Rept no. ISU-ERI-AMES-71048 ARL-74-0081
Contract F33615-68-C-1034

Descriptors: *Ceramic materials, Electrical properties, Creep, Diffusion, Sodium chloride, Alumina, Oxides, Rare earth compounds, Magnesium oxides, Barium titanates, Titanium oxides, Adsorption, Glass, Cobalt compounds, Nickel compounds, Manganese oxides, Piezoelectric materials, Semiconductors, Surface waves.
Identifiers: Neutron activation analysis, Cobalt oxides, Nickel oxides, Acoustic surface waves, Themis project.

The following topics are discussed: Creep in ceramic materials; creep in sodium chloride; adsorption isotherm studies; diffusion and strength of ceramic oxides; neutron activation analysis; barrier layer ferroelectrics; solid electrolytes; acousto-electric devices.

AD-779 954/7GA PC$4.00/MF$1.45
Iowa State Univ Ames Engineering Research Inst
PROPERTIES OF CERAMIC MATERIALS.
Progress rept. no. 20,
Thomas D. McGee. 31 Aug 72, 76p Rept no. ISU-ERI-AMES-72219 ARL-74-0082
Contract F33615-68-C-1034
See also Progress rept. no. 11, AD-708 712. Also includes summary rept., 1 Sep 71-31 Aug 72.

Descriptors: *Ceramic materials, *Composite materials, Surface waves, Diffusion, Creep, Oxides, Alumina, Titanium oxides, Sodium chloride, Magnesium oxides, Barium titanates, Fracture(Mechanics), Glass, Adsorption, Electrical properties, Thermodynamics, Fiberglass, Drawing(Forming).
Identifiers: Erbium oxides, Neutron activation analysis, Acoustic surface waves, Themis project.

Topics discussed include: High-temperature ceramic materials group--Creep in ceramic materials; creep in sodium chloride; diffusion and strength of ceramic oxides; Composite materials group--Adsorption isotherm studies; drawing glass fibers; neutron activation analysis; Barrier layer ferroelectrics; solid electrolytes; acousto-electric devices.

AD-780 177/2GA Reprint
Indian Inst of Tech Kanpur Dept of Metallurgical Engineering
ELECTRICAL CONDUCTIVITY OF PURE AND CAO-DOPED THO2 CERAMICS.
Journal article,
A. K. Mehrotra, H. S. Maiti, and E. C. Subbarao. 2 May 73, 11p ARL-74-0065
Grant AF-AFOSR-2136-71
Availability: Pub. in Materials Research Bulletin, v8 p899-908 1973.

Descriptors: *Thorium dioxide, *Electrical conductivity, *Calcium oxides, India.

The a.c. total conductivity (sigma) of pure and CaO-doped thoria samples has been measured in air in the temperature range of 600 to 1400C. For each sample, the activation energy for conduction has been calculated from a plot of sigma T vs. 1/T, where T is absolute temperature. The present results have been compared with those existing on both ThO2-CaO and ThO2-YO(1.5) ceramics. (Author)

AD-780 440/4GA PC$3.25/MF$1.45
Naval Ship Research and Development Center Annapolis Md
CERAMICS FOR GAS TURBINE APPLICATIONS (A STATE-OF-THE-ART SURVEY),
S. J. Dapkunas. May 74, 37p* Rept nos. NSRDC-4199, NSRDC-28-769

Descriptors: *Ceramic materials, Gas turbines, Reviews, State of the art, Silicon nitrides, Silicon carbides, Hot pressing, Mechanical properties, Rupture, Thermal shock, Impact strength, Tensile properties, Stresses, Creep, Fatigue(Mechanics), Oxidation, Corrosion, Heat.

Silicon nitride and silicon carbide are shown to be the ceramics having the most promise, with major efforts currently under way to develop these materials for use in the near future. Mechanical properties and data on oxidation and hot corrosion have been compiled and presented for comparison with those of currently available superalloys. These comparisons show hot-pressed ceramics to have strength and environmental resistance superior to nickel- and cobalt-base superalloys at elevated temperatures but lacking in impact strength. Reaction-sintered silicon nitride is shown to be a low-strength material. Hot-pressed silicon nitride and silicon carbide are expected to find application in situations where strength and reliability rather than cost are determining factors, whereas reaction-sintered silicon nitride offers distinct advantages when low cost achieved through mass production is of great importance for lower stress applications. (Modified author abstract)

CONF-740414-1 PC$3.00/MF$1.45
Argonne National Lab., Ill. (Usa).
MATERIALS STUDIES IN SUPPORT OF LIQUID METAL MHD SYSTEMS.
W. D. Tuohig, J. T. A. Roberts, and R. N. Singh. 1974, 8p

Descriptors: (*Ceramics, *Corrosion resistance), (*Lithium, *Corrosive effects), Dielectric materials, Liquid metals, Mhd generators, Sodium.

For abstract, see NSA 29 12, number 29981.

11C. Coating, Colorants, and Finishes

AECL-4706 PC$4.50/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
DEVELOPMENT OF OXIDATION-RESISTANT COATINGS FOR ZIRCONIUM ALLOYS.
C. Roy. Jan 74, 30p

Descriptors: (*Zirconium, *Protective coatings), (*Zircaloy 2, Protective coatings), Interfaces, Oxidation, Zirconium oxides.

For abstract, see NSA 29 12, number 30044.

COM-74-11074/3GA PC$8.50/MF$1.45
National Bureau of Standards, Washington, D.C.
SURVEY PLANS AND DATA COLLECTION AND ANALYSIS METHODOLOGIES: RESULTS OF A PRE-SURVEY FOR THE MAGNITUDE AND EXTENT OF THE LEAD BASED PAINT HAZARD IN HOUSING. FINAL REPT.,
William Hall, Tyrone Ayers, and Dwight Doxey. 1974, 109p NBSIR-74-426

Descriptors: *Lead(Metal), *Paints, *Lead poisoning, Toxicology, X ray fluorescence, Computer programs, Residential buildings, Surveys, District of Columbia, Urban areas, Detectors, Tests.
Identifiers: *Lead based paints.

A pilot survey of housing in Washington, D.C. was carried out in order to develop and test methodologies, data collection procedures and formats that will be used in subsequent full scale surveys of cities to determine the magnitude and extent of the lead-based paint hazard in housing. On site measurements of lead contents of interior and exterior surfaces were made (with portable x-ray fluorescence lead detectors, hereafter referred to as XRF's) on 115 dwelling units which were randomly selected from a Washington, D.C. city directory. This report describes the procedures for identifying the survey sample, drawing the sample, and carrying out the survey. Computer programs for data handling and analysis are included and a brief summary of the data obtained from the pilot survey is presented.

COM-74-11078/4GA PC$7.50/MF$1.45
National Bureau of Standards, Washington, D.C. Center for Building Technology.
REPORT ON A PRE-TEST OF A SURVEY PLAN FOR ESTIMATING INCIDENCE OF LEAD BASED PAINT.
Final rept.,
Lambert S. Joel, and Harvey W. Berger. Dec 73, 86p NBSIR-73-407

Descriptors: *Paints, *Lead(Metal), Concentration(Composition), Statistical samples, Chemical analysis, Surveys, Residential buildings, Recommendations, Public health, Children, Lead poisoning, Tables(Data), Regulations, Consumers.
Identifiers: *Lead based paints.

Lead in paint has been indicted as a major cause of lead poisoning of children. Federal regulations have been established to limit the amount of lead which may be added to paints that are intended for residential use. The intent of such a limitation is to curtail the incidence of present and future lead based paint poisoning of children. The report presents the results of a 'pre-test' for a nationwide survey plan that would be used to determine the availability, to the public, of paints that may contain lead compounds in hazardous quantities. Statistical summaries of the chemical analysis of 250 paints purchased by random selection at five retail outlets, are presented along with comments regarding the possible implications of those results. Recommendations are made about survey action beyond the pre-test described herein.

PATENT-3 304 276 Not available NTIS
Department of Agriculture, Washington, D.C.
POLYHYDRIC PHENOL MODIFIED FATTY MEDIA AND IRON SURFACES CHELATED THEREWITH.
Patent, *Filed 13 May 64, patented 14 Feb 67, Raymond Noel Faulkner, and Leonard Alfred O'Neill. 14 Feb 67, 8p PAT-APPL-367 262,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vegetable oils, *Polyhydric phenols, *Primers(Coatings), Alkyd resins, Chelates, Metalorganic compounds, Catalysts, Steel, Waterproof coatings.
Identifiers: PAT-CL-260 22.

The patent concerns metal-reactive primer-type coatings comprising gallate, tannate, or pyrogallol modified vegetable oils, vegetable oil fatty esters, and alkyds. They react in situ with iron and steel surfaces to form diffusible organometallic complexes that leave the metal surface and effect curing of the coating to durable films containing residual phenol groups. The polyhydric phenol-modified oil alkyds cure even at room temperature to rust inhibiting, non-blistering finishes.

PATENT-3 321 320 Not available NTIS
Department of Agriculture, Washington, D.C.
IRON BUTOXIDE IMPROVED POLYHYDRIC PHENOL MODIFIED ALKYD COMPOSITIONS.
Patent, *Filed 25 Mar 65, patented 23 May 67,
Raymond Noel Faulkner, and Leonard Alfred O'Neill. 23 May 67, 5p PAT-APPL-442 831,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Alkyd resins, *Primers(Coatings), *Additives, Steels, Corrosion resistance, Curing, Polyhydric phenols.
Identifiers: *Iron butoxides, PAT-CL-106-14.

The patent describes alkyd primer coatings for steel. They exhibit improved cure and resistance to corrosion when a small amount of iron butoxide is incorporated in ethylene glycol monoethyl ether or mixed ethylene glycol monoethyl ether/naphtha solutions of the alkyd prior to application to a clean steel surface.

PATENT-3 343 974 Not available NTIS
Department of Agriculture, Washington, D.C.
COMPOSITION FOR INCREASING THE DISPERSION STABILITY OF TITANIUM DIOXIDE PIGMENT.
Patent, *Filed 13 May 64, patented 26 Sep 67,
Raymond Noel Faulkner, and Edwin Enfield Berry. 26 Sep 67, 1p PAT-APPL-367 261,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Titanium dioxide, *Dispersions, *Pigments, *Patents, Paints, Phosphorus organic compounds, Acetone.
Identifiers: PAT-CL-106-300, Oleic acid/methyl ester, Ethanol/ethoxy.

This invention relates to an unobvious method of pretreating rutile (titanium dioxide pigment) to greatly increase its dispersibility. Rutile is a mineral pigment that is widely employed in paints, enamels, and ceramics, and the well known tendency of it and other paint pigments to settle has evoked many efforts at improvement. Shaking or stirring rutile in a very dilute solution of phosphorylated (P-acid) methyl oleate in acetone or in a corresponding solution in ethylene glycol monoethyl ether followed preferably by a washing in fresh solution and drying of the treated pigment impressively improves its dispersibility.

PATENT-3 778 405 Not available NTIS
Department of the Air Force Washington D C
PROCESS FOR PREPARING A POLYPHENYLENE LACQUER AND LAMINATES FABRICATED THEREWITH.
Patent,
Norman Bilow. Filed 30 Dec 71, patented 11 Dec 73, 3p Rept nos. PAT-APPL-214 462,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Laminated plastics, *Plastic coatings, Sulfur organic compounds, Crosslinking(Chemistry), Chloroform, Polyphenyl compounds, Copolymerization.
Identifiers: PAT-CL-260-33-8-R, *Lacquers, Copolymers, *Polyphenylenes, *Sulfonyl halides.

The invention relates to a process for preparing a polyphenylene lacquer. A substantially void-free laminate or composite is provided that comprises a reinforcing material coated with a cured copolymer of polyphenylene and a polysulfonyl halide, the copolymer having been prepared by reaction in an alcohol-free chloroform medium and applied to the reinforcing material as a solution in the medium. It has been discovered that by conducting the reaction in alcohol-free chloroform, a thermosetting polyphenylene resin is produced that has superior molding characteristics as well as better wetting characteristics.

11D. Composite Materials

AD-779 836/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STRENGTH OF COMPOSITE BODIES WEAKENED BY CRACKS,
L. T. Berezhnitskii, V. V. Panasyuk, and G. P. Cherepanov. 19 Apr 74, 13p Rept no. FTD-HT-23-1489-74
Edited trans. of Kontsentratsiya Napryazhenii (USSR) n3 p10-15 1971, by Rene E. Courville.

Descriptors: *Composite materials, *Fracture(Mechanics), Crack propagation, Translations, USSR.

AD-779 907/5GA PC$3.75/MF$1.45
Monsanto Research Corp St Louis Mo
MOLDING OF ORIENTED SHORT FIBER COMPOSITES. III. RATE EFFECTS ON FIBER ALIGNMENT IN CONVERGENT CHANNELS.
L. A. Goettler. May 74, 68p Rept no. HPC-72-150
Contract N00014-67-C-0218, ARPA Order-876
See also report dated 5 Apr 74, AD-776 591.

Descriptors: *Fiber reinforced composites, *Moldings, Fiberglass, Alignment, Fiber reinforcement, Composite materials, Epoxy compounds, Epoxy resins, Molding techniques, Flow rate, Tensile properties.
Identifiers: Transfer molding, Plunger molding, *Oriented fiber composites.

In an extension of the experiments performed on the compacted flow of a glass fiber-filled epoxy resin through a conical converging channel under a high pressure, the study examines the orientability of the fibers as the suspension flows into an empty mold cavity. The tensile properties of molded rods of 1/4 in. to 1/2 in. diameter reflect the level of orientation produced. Both the fiber orientability and the resulting orientation distribution depend strongly on the rate of elongation. The molded-in orientation distribution is also determined by the extent of convergence. Convergence angle, viscosity, and fiber length are secondary variables. The results indicate that fibers can be oriented to within 20 degrees of the flow axis by this technique in order to maximize elongation is thought to result from the high voidage in the material during flow. (Author)

AD-779 927/3GA PC$4.00/MF$1.45
Air Force Flight Dynamics Lab Wright-Patterson AFB Ohio
ULTIMATE STRENGTH ANALYSIS OF SYMMETRIC LAMINATES.
Technical rept.,
R. S. Sandhu. Feb 74, 87p Rept no. AFFDL-TR-73-137

Descriptors: *Composite materials, *Laminates, Strength(Mechanics), Failure(Mechanics), Failure, Mathematical analysis, Epoxy compounds, Boron, Fiber reinforced composites.
Identifiers: Ultimate strength, Oriented fiber composites, Spline functions.

A technique is presented for predicting the response of failure of composite laminates. In this technique, cubic spline interpolation functions are used to represent basic stress-strain curves obtained from simple tests. This representation in conjunction with an incremental constitutive law is used to generate response of laminates subjected to incremental loads. The ultimate load-carrying capacity of the laminates is determined by the plywise application of a new failure criterion using strain energy under longitudinal, transverse, and shear loadings as independent parameters. Results obtained by this technique are compared with the available experimental data of boron-epoxy laminates as well as the responses generated by methods of Petit-Waddoups and Hahn. Analytical results determined by the present theory correlate with the experimental data better than those obtained by the other two techniques. (Author)

AD-780 106/1GA PC$3.75/MF$1.45
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Engineering Science and Mechanics
FATIGUE CRACK INITIATION IN A BORON EPOXY PLATE WITH A CIRCULAR HOLE.
Interim rept.,
Larry A. Marcus, Wayne W. Stinchcomb, and Haldun M. Turgay. Feb 74, 68p Rept no. VPI-E-74-6 AFOSR-TR-74-0833
Grant AF-AFOSR-2358-72

Descriptors: *Laminates, *Fiber reinforced composites, *Fatigue(Mechanics), Crack propagation, Plates, Shear stresses, Thermography, Radiography, Strain(Mechanics).
Identifiers: Boron reinforced plastics, Epoxy matrix composites, Finite element analysis.

Numerical results for the stress state around a circular hole in a (0/ pulse or minus 45/0)s boron-epoxy plate under tensile loading are presented. This serves as a model for the initial stress state around the hole during fatigue loading. Comparison is drawn with experimental results for a fatigued specimen obtained from thermography and radiography. Using these results an interpretation of the effects of the initial stress state on the thermal behavior and on failure initiation is given. This interpretation shows that the circumferential normal stresses are responsible for heat generation, and failure initiation is influenced by the interlaminar shear stresses in the outer 0 degree and +45 degree layers.

AD-780 122/8GA PC$3.25/MF$1.45
Technion - Israel Inst of Tech Haifa Dept of Materials Engineering
DETERMINING THE LOAD-TIME HISTORY OF FIBER COMPOSITE MATERIALS BY ACOUSTIC EMISSION,
A. Rotem, and J. Baruch. Mar 74, 27p Rept nos. MED-44, Scientific-2 AFOSR-TR-74-0871
Grant AF-AFOSR-2607-74

Descriptors: *Fiber reinforced composites, Acoustic emissions, Composite materials, Fiberglass, Epoxy resins, Epoxy compounds, Matrix materials, Monitoring, Fracture(Mechanics), Fatigue(Mechanics), Loads(Forces), Israel.
Identifiers: *Oriented fiber composites.

Acoustic emission was monitored during the axial loading of unidirectional fiber composite tensile specimens. The material consisted of strong, brittle fibers (E glass) imbedded in a viscoelastic matrix (epoxy). It was found that when the load was held constant the acoustic emission output continued, but at a decreasing rate with time at load. As the load level was increased, the acoustic emission output at load continued for a longer period. It is suggested that the acoustic emission under constant load is a result of fibre fracture which continues after loading ceases because of the viscoelastic nature of the matrix which allows stress redistribution with time. The experimental results from acoustic emission are compared with computer calculations for fibre fracture based on theoretical considerations. Good agreement is noted between the theoretical and experimental results. (Author)

AD-780 233/3GA PC$4.75/MF$1.45
Mcdonnell Douglas Astronautics Co Huntington Beach Calif
MECHANICS OF FAILURE OF COMPOSITES.
Final summary rept. 1 Apr 73-31 May 74,
Longin B. Greszczuk. May 74, 129p* Rept no. MDC-G5365
Contract N00019-73-C-0405

Descriptors: *Fiber reinforced composites, Failure, Tensile strength, Shear strength, Rein-

forced plastics, Carbon fibers, Microstructure, Stress strain relations, Transverse, Elastic properties.
Identifiers: Phenolic matrix composites, Graphite reinforced composites, Fiberglass reinforced plastics.

Experimental and theoretical studies are presented on the influence of composite microstructure on the transverse tensile and shear strength of graphite and glass fiber-reinforced composites predicted from the previously formulated failure criteria. Sensitivity of the transverse and shear strength to variations and errors in fiber content, void content, resin content, specific gravity of composite, and properties of the fibers and the matrix is investigated. Results of the sensitivity studies are employed to predict the scatter in transverse and shear strength data as influenced by variables noted above. The predicted scatter in test data is shown to correlate well with actual scatter. The validity, importance, and effect of assumptions made in failure theory formulations are also investigated including the influence of fiber array, void shape, inelastic matrix effects, residual thermal stresses, and fiber-matrix interface. An approximate solution is presented for the residual thermal stresses in composites consisting of orthotropic fibers and isotropic matrix. Studies are also presented on compressive strength and failure modes of unidirectional composites. (Modified author abstract)

AD-780 333/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIMENTAL STUDY OF FAILURE PROCESS IN REINFORCED PLATES,
V. V. Bolotin. 30 Apr 74, 13p Rept no. FTD-HT-23-778-74
Edited trans. of Energeticheskii Institut, Moscow. Trudy (USSR) n74 p115-124 1970, by Marilyn Olaechea.

Descriptors: *Laminates, *Fiber reinforced composites, *Fracture(Mechanics), Epoxy resins, Fiberglass, Failure, Crack propagation, Strain(Mechanical), Translations, USSR.
Identifiers: Epoxy laminates, Fiberglass reinforced plastics.

The failure process of reinforced plates is studied under a constant rate of strain and maintained under constant strain conditions. The results of the statistical processing are compared with theoretical results obtained from a stochastic model. Mechanisms which might control the propagation of a main crack are discussed.

AD-780 425/5GA PC$4.00/MF$1.45
Battelle Columbus Labs Ohio
COMPOSITE DESIGN SYNTHESIS.
Final technical rept.,
Milton Vagins. 14 Jun 74, 80p*
Contract N00014-72-C-0195, ARPA Order-1977

Descriptors: *Composite materials, *Structural mechanics, Structural properties, Elastic properties, Synthesis, Disks, Shells(Structural forms), Cylindrical bodies, Computer programs, Methodology.
Identifiers: Design, DOMOV1 computer program.

The research carried out deals with the problem of design synthesis in heterogeneous elasticity. Design synthesis is defined as the achievement of a desired design criterion, i.e., stress distribution, strength-to-weight ratio, etc., by preselecting a stress or displacement pattern in a stretched plate and then determining the variation of the elastic moduli that is required to permit the desired effects. This accomplishment requires the solution of the governing equations of elasticity, particularly the compatibility equation, in terms of preselected stress fields in the body of the plate for unknown material properties which are spatial functions.

COO-1794-18 PC$12.25/MF$1.45
Illinois Inst. Of Tech., Chicago (Usa).
STRENGTHENING AND TOUGHENING OF BRITTLE MATERIALS. PROGRESS REPORT, JANUARY 31, 1973--JANUARY 31, 1974.
L. J. Broutman, and P. K. Mallick. 1974, 202p
Contract AT(11-1)-1794

Descriptors: Brittleness, Composite materials, Epoxides, Filaments, Finite element method, Fracture properties, Interfaces, Mechanical properties, Particles, Reinforced materials, Research programs, Resins, Spheres, Stress analysis, Whiskers.

For abstract, see NSA 29 12, number 31640.

PATENT-3 770 488 Not available NTIS
Department of the Air Force Washington D C
METAL IMPREGNATED GRAPHITE FIBERS AND METHOD OF MAKING SAME.
Patent,
Roger T. Pepper, and Ernest G. Kendall. Filed 6 Apr 71, patented 6 Nov 73, 5p Rept nos. PAT-APPL-131 823,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Fiber reinforced composites, *Composite materials, *Patents, Graphite, Metals, Matrix materials, Carbon fibers, Impregnation, Aluminum, Magnesium, Aluminum alloys, Magnesium alloys.
Identifiers: PAT-CL-117-47-R, Graphite reinforced composites, Metal matrix composites, Aluminum matrix composites.

The patent describes a technique for effecting the impregnation of graphite yarn with a metal matrix. The process includes enhancing the wettability of the graphite yarn by initially immersing the yarn in a metal infiltrate composed of either a molten tin-titanium alloy, or a molten copper-tin-titanium alloy of molten sodium. After removal from the molten infiltrate, the yarn is then immersed into a molten bath of a metal impregnate composed of either aluminum, aluminum-base alloys, magnesium, or magnesium-base alloys. The metal impregnant leaches out the metal infiltrate from the graphite yarn. This permits the metal impregnant to fill up the interstices of the yarn and coat the graphite filaments of the yarn.

11E. Fibers and Textiles

AD-779 886/1GA PC$3.25/MF$1.45
Navy Clothing and Textile Research Unit Natick Mass
FLAME-RETARDANT CLOTHING AND TEXTILE ITEMS FOR USE IN OXYGEN-ENRICHED ENVIRONMENTS OF DECOMPRESSION CHAMBERS.
Technical rept.,
George S. Higginbottom, and John Silvia, Jr. Jun 74, 29p Rept nos. TR-110, 1-74

Descriptors: *Fire protective clothing, *Underwater equipment, Diver equipment, Oxygen, Environments, Decompression, Chambers, Laboratory tests, Fire resistant materials, Flammability.

The Navy Clothing and Textile Research Unit (NCTRU) has developed clothing and textile items for use in the fire-hazardous, oxygen-enriched atmospheres of divers' decompression chambers. Small-scale laboratory tests on the flame retardancy of materials in oxygen-enriched environments led to the selection of candidate materials offering a potential for use. Full-scale flammability tests were performed on items made from materials selected for further study. Analyses of all test results led to the selection of Durette (modified Nomex) fabrics as offering the best compromise choice of materials for use in end-item constructions. Clothing and textile items were manufactured and forwarded to selected Navy decompression-chamber sites, which are using them on a permanent basis. Information based upon a limited use has shown the items to be acceptable in terms of design, performance and durability. Static generation on Durette materials, reported by some activities, can be effectively controlled by the use of anti-stat softeners during the laundry cycle. (Modified author abstract)

AD-780 430/5GA PC$3.25/MF$1.45
Naval Ordnance Lab White Oak Md
EXPLORATORY EVALUATION OF POLYPHENYLQUINOXALINE FIBER AS A PRECURSOR FOR HIGH MOL MODULUS CARBON FIBER.
Technical rept.,
J. M. Augl. 30 Apr 74, 37p Rept no. NOLTR-74-57

Descriptors: *Carbon fibers, Mechanical properties, Filaments, Yarns, Crosslinking(Chemistry), Diameter.
Identifiers: *Polyquinoxalines, *Carbonization, Graphitizing, Stretching.

Polyphenylquinoxaline yarn was stretch-oriented to about twice its original length at 375C. This yarn was then carbonized under various conditions. The filament properties were measured on batch-graphitized yarn which had been subjected to various prior heat processing conditions (stretch-orientation, continuous carbonization, and heat soaking at 390C). Subsequent crosslinking studies on PPQ indicated that PPQ must be preheated to at least between 450 and 480C in an inert atmosphere to obtain a reasonable degree of crosslinking for proper fiber stabilization. (Modified author abstract)

TT-72-51099 PC$3.00/MF$1.45
Agricultural Research Service, Washington, D.C.
RESISTANCE OF COTTON FABRICS TREATED WITH ORGANOSILICON COMPOUNDS TO THE ACTION OF CUPRAMMONIUM REAGENT (USTOICHIVOSTK DEISTVIYU MEDNOAMMYACHNOGO REAKTIVA KHLOPCHATOBUMAZHNYKH TKANEI, OBRABOTANNYKH KREMNIYORGANICHESKIMI SOE DINENIYAMI),
S. M. Gubina, A. S. Solovev, and B. N. Melnikov. 1973, 8p
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Khimiya i Khimicheskaya Tekhnologiya (USSR) v14 n1 p130-133 1971. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Textile finishing, *Cotton fabrics, *Silicones, *Chemical resistance, Polymers, Siloxanes, Viscosity, Crosslinking, USSR, Translations.
Identifiers: Cuprammonium.

The influence of the chemical structure of organosilicon compounds on the stability of cotton fabric, finished with these compounds, to the action of cuprammonium reagent has been studied in this work. The authors used polymethylsiloxanes of varying degree of polymerization, polyethylhydrosiloxane, polymethylvinylhydrosiloxane, polymethylvinylsiloxane and the compound A-41, which is a cyclosiloxane with methyl and vinyl radicals. The samples of cotton fabric were impregrated with a 3% emulsion of silicone, dried and subjected to thermal treatment for 5 minutes at 150 degrees and for 3 minutes at 170 degrees. After conditioning, the specific viscosities of cuprammonium solutions of cellulose, which were kept for 4 hours in ampoules, was determined.

11F. Metallurgy and Metallography

AD-779 806/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio

METHOD FOR DETERMINING THE THERMAL CONDUCTIVITY COEFFICIENT OF METALS AT HIGH TEMPERATURES,
V. S. Kobushko, B. A. Merinov, and V. I. Khotkevich. 19 Apr 74, 14p Rept no. FTD-HT-23-886-74
Edited trans. of mono. Eksperimentalnaya Tekhnika i Methody Vysokotemperaturnykh Izmerenii, n.p., 1966 p38-43, by Victor Mesenzeff.

Descriptors: *Thermal conductivity, *High temperature, Measurement, Metals, Platinum, Resistance thermometers, Translations, USSR.

In this work current-heated wire specimens were used in the determination of the thermal coefficient. The authors measured electrical resistance of the middle section of such a specimen which is essentially a thermometer of resistance. A regular connection between the total length of the wire and electrical resistance of its middle section was seen. The origin of this regularity is connected with the presence of the heat flux along the wire to its ends due to thermal conductivity, which, ultimately, makes it possible to determine the value of the thermal conductivity coefficient.

AD-779 830/9GA PC$3.75/MF$1.45
Air Force Materials Lab Wright-Patterson AFB Ohio
RELIABILITY ANALYSIS OF FATIGUE-SENSITIVE AIRCRAFT STRUCTURES UNDER RANDOM LOADING AND PERIODIC INSPECTION.
Technical rept. Oct 73-Jan 74,
Jann-Nan Yang, and Walter J. Trapp. Feb 74, 62p Rept no. AFML-TR-74-29

Descriptors: *Aircraft, *Fatigue(Mechanics), *Fracture(Mechanics), Crack propagation, Reliability, Numerical analysis, Loads(Forces), Structural properties, Maintenance, Detection, Cracks.

A reliability analysis of fatigue-sensitive structures, based on the application of random vibration theory, is presented. The fatigue process involved here consists of crack initiation, crack propagation and strength degradation. After a fatigue crack is initiated, fracture mechanics is applied to predict crack propagation under random loading. The aircraft structure is subjected to periodic inspection in service. When a fatigue crack is detected during inspection, the implicated component is either repaired or replaced. Such a renewal process is taken into account in the present analysis. Taking into account all the random variables as well as the random loadings, the solution for the probability of first failure in a fleet of aircraft is derived. (Modified author abstract)

AD-779 885/3GA PC$3.00/MF$1.45
California Inst of Tech Pasadena W M Keck Lab of Engineering Materials
MOBILITY OF FAST-MOVING SECOND-ORDER PYRAMIDAL DISLOCATIONS IN ZINC AT 77K AND 296K.
Interim rept. 1 Oct 72-30 Sep 74,
Thad Vreeland, Jr., and Kenneth M. Jassby. 1 Apr 74, 10p AROD-11007.1-MC
Grant DA-ARO-D-31-124-73-G47

Descriptors: *Zinc, *Crystal defects, *Dislocations, Mobility, Cryogenics, Plastic deformation.

Slip bands were produced by compression stress pulses at 77K and 296K and observed by X-ray reflection topography. Viscous behavior of edge, screw, and mixed dislocations was observed at velocities in the range 1000 cm/sec to about 80,000 cm/sec. The drag coefficient for second-order pyramidal dislocations was calculated from the measurements. The results indicate that phonon drag limits the dislocation velocity in these experiments. (Author)

AD-779 934/9GA PC$4.00/MF$1.45
Cabot Corp Kokomo Ind Stellite Div
FEASIBILITY OF MAKING AN OXIDE DISPERSION-STRENGTHENED COBALT-BASE ALLOY BY MECHANICAL ATTRITION.
Final technical rept. 1 Jul-31 Dec 73,
D. L. Klarstrom, and R. Grierson. Mar 74, 76p AFML-TR-74-34
Contract F33615-73-C-5150

Descriptors: *Cobalt alloys, Dispersion hardening, Nickel alloys, Chromium alloys, Aluminum alloys, Yttrium oxides, Powder alloys, Heat resistant alloys, Super alloys, Extrusion, Feasibility studies.
Identifiers: Cobalt alloy 18Cr 20Ni, Cobalt alloy 4Al 16Cr 20Ni.

The feasibility of making an oxide dispersion-strengthened, cobalt-base alloy by mechanical attrition was investigated. The optimum blend of starting powders to produce a Co-20Ni-18Cr-1Y2O3 base composition was determined. Using this blend, four different alloys were produced: two contained 1% and 2% Y2O3 and no aluminum, and two contained 1% and 4% aluminum with 1% Y2O3, respectively. A full scale property evaluation was performed for each alloy composition on extrusions produced at four different temperatures with a reduction ratio of 16:1. (Modified author abstract)

AD-779 937/2GA PC$3.25/MF$1.45
Dayton Univ Ohio Research Inst
MECHANICAL PROPERTIES OF TI-6AL-4V ANNEALED FORGINGS.
Final rept. Jun 71-Oct 73,
Russell R. Cervay. Mar 74, 32p Rept no. UDRI-TR-73-16 AFML-TR-74-49
Contract F33615-72-C-1282

Descriptors: *Titanium alloys, Mechanical properties, Aluminum alloys, Vanadium alloys, Forging, Corrosion, Crack propagation, Tensile properties, Fracture(Mechanics), Toughness.
Identifiers: Titanium alloy 6Al 4V.

Tests were conducted to determine the mechanical properties of titanium 6Al-4V annealed forgings. Tensile, fracture toughness, and constant amplitude cyclic crack growth properties were obtained along with limited corrosion studies of fastener installations. The tensile properties were determined for three orientations and the fracture toughness properties for four orientations. Some of the tensile and fracture toughness specimens were subjected to a time-temperature exposure before being tested at room temperature. The mechanical properties of the annealed material were similar to those in the literature. The time-temperature exposure cycle slightly altered the mechanical properties of the material. The corrosion tests conducted on the fastener installations did not produce any cracking in the material under the test conditions. (Author)

AD-780 017/0GA PC$4.00/MF$1.45
California Univ Berkeley Lawrence Berkeley Lab
UNTEMPERED ULTRA HIGH STRENGTH STEELS OF HIGH FRACTURE TOUGHNESS.
Final rept. 16 Mar 73-15 Mar 74,
E. R. Parker, V. F. Zackay, G. Y. Lai, and R. M. Horn. Apr 74, 77p Rept no. LBL-2715 AMMRC-CTR-74-33
Contract DAAG46-73-C-0120

Descriptors: *Steel, *Fracture(Mechanics), *Fatigue(Mechanics), Microstructure, Crack propagation, Austenite, Heat treatment, Martensite.
Identifiers: *Fracture toughness, Steel 4340, Steel 5Mo.

The objective of the present investigation was to establish, in high yield strength steels, relationships between microstructure, fracture toughness and fatigue crack growth. Extensive microstructural examination and characterization were conducted on as-quenched, and quenched and tempered AISI 4340 steel which was austenitized both at the conventional (870C) and the high (1200C) austenitizing temperatures. Changes in fracture toughness resulting from variations in austenitizing and tempering treatments were related to changes in the amount and distribution of retained austenite, the morphology and distribution of carbides, and the martensite substructure and morphology. The influence of microstructure on fatigue crack propagation was investigated in as-quenched, and quenched and tempered 5Mo-0.3C secondary hardening steel. (Modified author abstract)

AD-780 021/2GA PC$3.25/MF$1.45
Boston Univ Mass Dept of Aerospace Engineering
DYNAMIC PROPERTIES OF MATERIALS. PART II. ALUMINUM ALLOYS.
Final rept.,
C. W. Jiang, and M. M. Chen. Apr 74, 50p* AMMRC-CTR-74-23
Contract DAAG46-73-C-0181
See also Part 1, AD-780 020, and Part 3, AD-780 026.

Descriptors: *Aluminum alloys, *Dynamic loads, Yield strength, Strain rate, Elongation, Tables(Data), Temperature, Bibliographies.
Identifiers: Aluminum alloy 6061, Aluminum alloy 7075.

A literature survey on the mechanical properties of aluminum alloys under dynamic loadings has been made. The experimental data showing the variation of yield, ultimate strengths and elongation with strain rate and temperature are compiled and tabulated. The range of strain rate included in this report is from 0.00001 in/in/sec to 10,000 in/in/sec, while the temperature range is from -300F to 900F. The variations of yield and ultimate strengths are plotted for 6061 and 7075 aluminum alloys. It is shown that both the yield and ultimate strengths are higher under dynamic loads than under static loads. However, the aluminum alloys are not as strongly affected by strain rate as polymers and steels. It is also shown that the yield and ultimate strengths decrease with an increase of temperature. (Author)

AD-780 026/1GA PC$4.00/MF$1.45
Boston Univ Mass Dept of Aerospace Engineering
DYNAMIC PROPERTIES OF MATERIALS. PART III. STEELS.
Final rept.,
P. Soohoo, C. W. Jiang, and M. M. Chen. Apr 74, 96p* AMMRC-CTR-74-24
Contract DAAG46-73-C-0181
See also Part 2, AD-780 021.

Descriptors: *Steel, *Dynamic loads, Stress strain relations, Strain rate, Yield strength, Temperature, Bibliographies, Tables(Data).

A survey of the literature has been conducted to obtain and compile existing experimental data on the pertinent mechanical properties of steels subject to dynamic loading conditions and under a wide temperature range. Data showing the variation of yield strength and elongation with strain rate and temperature are categorized and tabulated. The effect of the dynamic properties of steels due to strain rate variation at room temperature is shown graphically. Separate curves for steels in tension and compression are presented. A comprehensive reference and bibliography section is provided. The behavior of steels under dynamic loading is generally different from that under static loading. The yield strength is higher under dynamic loading, and it decreases with increasing temperature. (Modified author abstract)

AD-780 044/4GA PC$3.75/MF$1.45
TRW Inc Cleveland Ohio
ISOTHERMAL FORGING OF PRECISION METAL POWDER COMPONENTS.
Interim rept. 1 Nov 71-30 Jun 73,
F. T. Lally, and I. J. Toth. Dec 73, 63p* RIA-R-RR-T-6-95-73
Contract DAAF01-72-C-0502

Descriptors: *Forging, *Powder metallurgy, *Steel, Machine guns, Dies, Pressure, Costs.
Identifiers: M-85 guns(Cal .50).

The program was aimed at developing a process to produce complex shaped high performance components at reduced costs. The component, the cover for the M85 model .50 caliber machine gun, was creep forged to near net shape to eliminate many finish machining operations. The process employed minimum deformation type dies operating in the temperature range of 1300 to 1450F and using the superplastic behavior of fine grained, as-received and pretreated 46XX prealloyed powders. Process variables of die temperature, forging pressure and time as well as preform treatments, including loose powder, were investigated. Die temperature was found to be the major variable. Forgeability was found to be related to grain size, however, near theoretical density forgings were produced using as-received commercial powder and forging parameters of 1550-1600F die temperature and 20 KSI pressure. (Modified author abstract)

AD-780 092/3GA PC$3.75/MF$1.45
Southwest Research Inst San Antonio Tex Dept of Instrumentation Research
NONDESTRUCTIVE EVALUATION OF METAL FATIGUE.
Interim scientific rept. Mar 73-Jan 74,
J. R. Barton, F. N. Kusenberger, P. H. Francis, W. L. Ko, and J. Lankford, Jr. Feb 74, 61p* AFOSR-TR-74-0820
Contract F44620-70-C-0034
See also AD-762 608.

Descriptors: *Nondestructive testing, *Fatigue(Mechanics), Cracks, Ultrasonic tests, Magnetic signatures, Crack propagation, Detection, Electric currents, Leakage(Electrical), Metals, Fracture(Mechanics), Surface waves, Magnetic disturbances.
Identifiers: Steel 4340, Titanium alloy 6Al 4V.

The role of those nondestructive evaluation (NDE) methods that can provide quantitative information about fatigue cracks to aid in the fracture mechanics determination of crack 'state' is discussed. The qualitative characteristics of magnetic perturbation signatures from fatigue cracks in 4340 steel specimens which provide the bases for recent investigations are summarized. The results of the recent experiments involving the effects of post-crack heat treatments and probe orientations on crack signature characteristics are presented and discussed. While the significant signature characteristics do not appear to relate directly to certain physical features of fatigue cracks of interest, there is evidence that the magnetic signatures can provide quantitative information about the 'state' of a fatigue crack. Limited investigations of approaches to improve the detection of fatigue cracks in Ti-6Al-4V alloy using ultrasonic surface wave and electric current injection methods are described and the results summarized. Metallurgical sectioning efforts were continued in the vicinity of inclusions with fatigue cracks in the early stages of development and the results support a model for the early stages of fatigue crack development which can explain the occurrence of nonpropagating cracks. (Author)

AD-780 120/2GA PC$3.25/MF$1.45
Waterloo Univ (Ontario) Dept of Civil Engineering
CYCLIC INELASTIC DEFORMATION AND FATIGUE LIFE BEHAVIOUR OF NOTCHED COMPONENTS.
Interim rept.,
B. N. Leis, T. H. Topper, and C. V. B. Gowda. Apr 74, 41p AFOSR-TR-74-0869
Grant AF-AFOSR-2120-71

Descriptors: *Fatigue(Mechanics), *Plastic deformation, Notch sensitivity, Aluminum alloys, Steel, Stress strain relations, Cycles, Canada.
Identifiers: Aluminum alloy 2024, Steel 1015, Fatigue life.

Cyclic inelastic deformation response and fatigue notch factor are presented and discussed for two metals of contrasting stress-strain behaviour (an aluminum alloy 2024-T351 and a mild steel SAE 1015). Thin circular or elliptical notched plates fabricated from these metals were subjected to cyclic straining in a servo-controlled testing machine. Results of these tests are discussed in terms of cyclic stress and strain concentration factors and related to notch plate deformation through a parameter derived from Neuber's rule. The results indicate that the deformation analysis employed, rather than a material 'size effect' is responsible for values of K sub f less that K sub f. (Author)

AD-780 148/3GA Not available NTIS
Defence Standards Labs Maribyrnong (Australia)
BRITTLE WELD CRACK STARTERS IN DROP WEIGHT TESTS,
R. C. Barnes, and P. C. Hughes. 1974, 4p
Availability: Pub. in Australian Welding Jnl., p25-27 Jan/Feb 74.

Descriptors: *Welds, *Fracture(Mechanics), *Test methods, Brittleness, Standards, Crack propagation, Steel, Metals, Australia.

A number of brittle weld bead crack starters have been examined and the shortcomings of each are discussed. The standard ASTM methods have been found to be unreliable. A crack starter developed at DSL has been found to give reliable results. (Author)

AD-780 180/6GA PC$3.25/MF$1.45
Illinois Univ Urbana Dept of Theoretical and Applied Mechanics
LOW CYCLE FATIGUE BEHAVIOR AND CRACK PROPAGATION IN SOME STEELS,
Saurindranath Majumdar. Apr 74, 29p Rept nos. T/AM-387, UILU-ENG-74-6009
Grant DAHC15-72-G10, ARPA Order-2169

Descriptors: *Steel, *Fatigue(Mechanics), *Fracture(Mechanics), Crack propagation, Stress strain relations, Tensile properties.
Identifiers: Steel HY-80, Steel HY-130, Steel 3Co 5Cr 12Ni.

In a previous report, a fatigue crack propagation model was analyzed by considering fatigue crack propagation as a sequence of fatigue crack initiation events. This permitted correlation to be made between the fatigue crack growth resistance and low cycle fatigue properties of metals. Four steels were tested for low cycle fatigue behavior at the University of Illinois. Good correlation was obtained between the theoretically predicted crack propagation rate based on the measured low cycle fatigue properties of the four metals and experimentally observed crack propagation rates that were reported in the literature. Further, good estimates of crack propagation rates can be obtained on the basis of static tensile properties of the metals alone where cyclic properties are not available. (Author)

AD-780 188/9GA PC$3.00/MF$1.45
Illinois Univ Urbana Dept of Theoretical and Applied Mechanics
TRANSIENT ANALYSIS OF FATIGUE CRACK PROPAGATION UNDER A STEP INCREASE IN LOADING,
Saurindranath Majumdar. May 74, 25p Rept nos. T/AM-388, UILU-ENG-74-6010
Grant DAHC15-73-G-7, ARPA Order-2169
Sponsored in part by Grant DAHC15-72-G-10.

Descriptors: *Steel, *Fatigue(Mechanics), *Fracture(Mechanics), Crack propagation, Loads(Forces), Mathematical models.

In a previous report, steady state crack propagation at a constant stress intensity factor range was analyzed on the basis of a cumulative fatigue damage model. In this model, the points ahead of a crack tip were assumed to constitute a series of uniaxial fatigue specimen and fatigue crack propagation was viewed as the successive fatigue failure of these specimens. In this report an extension of the previous analysis to a situation involving an increase in the stress intensity factor range from a lower level to a higher level is carried out. The analysis indicates that there is a transient zone through which the crack has to grow before attaining the full steady state crack propagation rate corresponding to the higher load level. Numerical results have been computed for three steels of comparable ductility but widely varying yield strength The results show that both the crack length increment and the number of cycles involved in the transient period decrease with increasing yield strength. Also, for any given steel, the crack length increment during the transient increases with the load ratio but the number of cycles is independent of the load ratio. (Author)

AD-780 191/3GA PC$4.50/MF$1.45
Illinois Univ Urbana Dept of Theoretical and Applied Mechanics
FAILURE ANALYSIS OF MICROFLAWED DUCTILE MATRIX MATERIALS,
Ronald E. Frishmuth. Apr 74, 117p Rept nos. T/AM-384, UILU-ENG-74-6006
Grant DAHC15-72-G-10, ARPA Order-2169

Descriptors: *Fracture(Mechanics), Failure, Predictions, Stresses, Microstructure, Defects(Materials), Toughness, Numerical analysis.
Identifiers: *Cast iron.

It is shown in this study that linear elastic fracture mechanics techniques do not provide a consistent geometry-independent means of predicting failure in microflawed ductile matrix materials. Several aspects of microflawed material behavior during fracture testing suggest that considerable plastic behavior occurs on the microscale in microflawed materials. It is suggested that limit analysis techniques applied first on the microscale than extended to the macroscale may provide a consistent means of failure prediction. Three-dimensional limit surfaces are developed for several types of microflawed materials. Comparison of these limit criteria with currently available theories and experimental data on microflawed materials in the absence of macroscale notches shows that the proposed theory is valid for smooth material failure predictions. In the current study, several geometries of fracture toughness specimens were used. The material used was ASTM Class 60 pearlitic matrix gray cast iron with type A-1 graphite. (Modified author abstract)

AD-780 326/5GA Not available NTIS
National Research Council of Canada Halifax (Nova Scotia) Atlantic Regional Lab
EFFECT OF SRO ON DESULPHURIZING POWER OF SLAGS,
A. Kazi, and S. G. Whiteway. 1973, 5p Rept no. ARL-17 NRC-12911
Presented at the International Conference on Strontium-Containing Compounds Held at Halifax (Nova Scotia) Jun 73.
Availability: Pub. in Canadian Metallurgical Quarterly, v12 n4 p435-438 1973.

Descriptors: *Strontium compounds, *Slags, *Iron, Strontium compounds, Oxides, Canada.
Identifiers: *Desulfurization, Strontium oxides, Iron and steelmaking.

Molten iron-sulphur alloys were equilibrated in MgO crucibles with molten slags of the type CaO-SrO-FeO-SiO2. The results indicated that SrO has a desulphurizing power about twice that of CaO. (Author)

AD-780 340/6GA Reprint
Watervliet Arsenal N Y
METALLIC-CU X-RAY FORM FACTORS.
Technical rept.,
A. M. Gray. 18 Jul 73, 5p Rept no. WVT-TR-74015

Availability: Pub. in Physical Review B, v9 n6 p2773-2774, 15 Mar 74.

Descriptors: *Copper, *X ray diffraction, Crystal structure.
Identifiers: Form factors.

Two sets of experimental Cu x-ray form factors are compared for consistency in terms of a simple charge-distribution model. The results of Temkin, Henrich, and Raccah fit the model very well, while those of Hosoya and Yamagishi do not give a satisfactory fit.

AD-780 347/1GA Not available NTIS
Defence Standards Labs Maribyrnong (Australia)
TOUGHNESS DIFFERENCES BETWEEN SILICON-KILLED AND SEMI-KILLED MILD STEEL PLATE,
G. R. Wilms. 26 Nov 73, 7p
Revision of report dated 9 Sep 73.
Availability: Pub. in Jnl. of the Australian Inst. of Metals, v18 n4 p182-188 Dec 73.

Descriptors: *Steel, *Notch toughness, *Silicon, Australia.

The notch-impact properties of a commercial silicon-killed mild steel plate are compared with an equivalent grade semi-killed steel for different specimen orientations. Contrary to expectation, the notch toughness of the silicon-killed steel was lower than that of the semi-killed steel. Room-temperature tensile properties are also compared for different specimen orientations; higher yield and ultimate tensile strengths were obtained on the silicon-killed steel although ductility values were comparable with those for the semi-killed steel. It is concluded that none of these factors accounts for the lower notch toughness of the silicon-killed steel. (Modified author abstract)

AD-780 361/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A STUDY OF SURFACE TENSION OF TITANIUM ALLOYS USING THE METHOD OF MELTING IN A SUSPENDED STATE,
A. A. Fogel, O. N. Magnitskii, M. M. Mezdrogina, and N. I. Bronzova. 24 May 74, 11p Rept no. FTD-HT-23-1208-74
Edited trans. of mono. Voprosy Teorii Protsessov Litya, Kiev, 1969 p80-85, by Victor Mesenzeff.

Descriptors: *Titanium alloys, *Interfacial tension, *Rare earth elements, Rhenium, Cerium, Lanthanum, Neodymium, Translations, USSR.

In this work the authors studied the effect of certain rare-earth elements and rhenium on the surface tension of titanium. The surface tension values of Ce, La, Nd, and Re, determined by calculation, are lower than those for titanium.

AD-780 501/3GA Reprint
Illinois Inst of Tech Chicago Dept of Metallurgical and Materials Engineering
SPECIFICITY AS AN ASPECT OF LIQUID METAL EMBRITTLEMENT,
Francis A. Shunk, and William R. Warke. 8 Mar 74, 10p
Contract DAAA25-69-C-0608
Availability: Pub. in Scripta Metallurgica, v8 p519-526 1974.

Descriptors: *Embrittlement, *Liquid metals, Aluminum alloys, Magnesium alloys, Steel, Titanium alloys.

It is concluded that specificity as an aspect of liquid metal embrittlement is a feature that is of questionable validity, difficult to demonstrate and unaccounted for theoretically.

AI-AEC-13123 PC$4.00/MF$1.45
Atomics International Div., Canoga Park, Calif. (Usa).
PROTON RANGE AND ENERGY IN IRRADIATED TYPE 316 STAINLESS STEEL.
D. W. Keefer, and A. G. Pard. 15 Mar 74, 17p
Contract AT(04-3)-824

Descriptors: (*Stainless steel-316, *Physical radiation effects), (*Proton beams, *Range), Depth, Electron microscopy, Kev range 100-1000, Mev range 01-10, Voids.

For abstract, see NSA 29 12, number 30147.

CEA-CONF-2488 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. De Recherche Fondamentale.
ZENER RELAXATION ASSOCIATED WITH VACANCY SUPERSATURATIONS UNDER A FAST PARTICLE FLUX.
M. Halbwachs, J. Hillairet, and E. A. Bisogni. 10p
CONF-730844-6

Descriptors: (*Silver base alloys, *Physical radiation effects), (*Zinc alloys, Physical radiation effects), Electron beams, Fast neutrons, Internal friction, Neutron beams, Relaxation, Vacancies.

For abstract, see NSA 29 12, number 30148.

CNLM-2969 PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
EVALUATION OF CB--5% ZR FUSION WELDS.
J. R. Stewart. 30 Sep 60, 10p
Contract AT(11-1)-229

Descriptors: (*Niobium base alloys, *Mechanical properties), (*Zirconium alloys, Mechanical properties), (*Welded joints, Mechanical properties), Annealing, Bending, Creep, Ductility, Failures, Heat affected zone, Lithium, Ruptures.

For abstract, see NSA 29 12, number 30076.

COM-74-11061/0GA PC$5.00/MF$1.45
National Bureau of Standards, Washington, D.C. Inst. for Materials Research.
STANDARD REFERENCE MATERIALS: PREPARATION OF NBS WHITE CAST IRON SPECTROCHEMICAL STANDARDS.
Final rept.,
Robert E. Michaelis, and LeRoy L. Wyman. 19 Jun 64, 39p NBS-Misc Pub-260-1
Library of Congress Catalog Card no. 64-60045.

Descriptors: *Cast iron, *Spectrochemical analysis.
Identifiers: *Standard reference materials.

Several methods have been investigated for the preparation of cast iron spectrochemical standards and a satisfactory procedure has been devised. The method involves casting the molten metal into a grid type of mold on a massive water-cooled copper plate. The method has been applied to the preparation of eight NBS white cast iron spectrochemical standards containing a graded concentration range for some 20 elements, of which the following 10 initially have been certified: C, Mn, P, S, Si, Cu, Ni, Cr, V, and Mo. Details of the planning and preparation are given with particular emphasis on the problems peculiar to the standards for cast materials.

COM-74-50494/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ELASTIC PROPERTIES OF METALS AND ALLOYS. I. IRON, NICKEL, AND IRON-NICKEL ALLOYS.
Final rept.,
H. M. Ledbetter, and R. P. Reed. 1973, 87p
Pub. in Jnl. of Physical Chemistry Reference Data 2, n3 p531-617 1973.

Descriptors: *Elastic properties, *Iron, *Nickel, Iron alloys, *Nickel alloys, Tables(Data), Modulus of elasticity, Poisson ratio, Compressibility.

A comprehensive compilation is given of elastic properties of iron-nickel alloys. When sufficient data exist, preferred values are recommended. This compilation covers, besides pure iron and pure nickel, the entire binary composition range, both b.c.c. and f.c.c. phases. Elastic constants included are: Young's modulus, shear modulus, bulk modulus (reciprocal compressibility), Poisson's ratio, and single-crystal elastic stiffnesses, both second-order and higher-order. Data are compiled for variation of elastic constants with composition, temperature, pressure, magnetic field, mechanical deformation, annealing, and crystallographic transitions.

COM-74-50584/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
ELASTIC PROPERTIES OF TWO TITANIUM ALLOYS AT LOW TEMPERATURES.
Final rept.,
E. R. Naimon, W. F. Weston, and H. M. Ledbetter. May 74, 4p
Sponsored in part by Advanced Research Projects Agency, Arlington, Va.
Pub. in Cryogenics, v14 n5 p246-249 May 74.

Descriptors: *Titanium alloys, *Elastic properties, Acoustic velocity, Poisson ratio, Specific heat, Compressibility, Cryogenics.

Sound velocities and elastic constants were determined semi-continuously for two annealed polycrystalline titanium alloys between 4 and 300K. Results are given for: longitudinal sound velocity, transverse sound velocity, Young's modulus, shear modulus, bulk modulus, Poisson's ratio, and elastic Debye temperature. A pulse-superposition technique was used.

COM-74-50523/1GA PC-GPO/MF$1.45-NTIS.
National Bureau of Standards, Washington, D.C.
THE ROLE OF CAVITATION IN MECHANICAL FAILURES. PROCEEDINGS OF THE MEETING OF THE MECHANICAL FAILURES PREVENTION GROUP (19TH) HELD AT THE NATIONAL BUREAU OF STANDARDS, BOULDER, COLORADO ON OCTOBER 31, NOVEMBER 1 AND 2, 1973.
Final rept.,
T. R. Shives, and W. A. Willard. Apr 74, 179p
NBS-SP-394
Contract NAonr-70-74, NASA-S-55581-A
Library of Congress Catalog Card no. 74-7057.
Paper copy available from GPO $2.25 as C13.10:394.

Descriptors: *Cavitation, *Meetings, Bubles, Metals, Polymers, Damage, Erosion, Coatings, Cavitation corrosion, Lubricants, Surface roughness.

Contents: Physics associated with cavitation induced material damage; role of physical properties of liquids in cavitation erosion; the role of mechanical properties in cavitation erosion resistance; recent theories of cavitation damage including non-symmetrical bubble collapse effects; some practical examples of cavitation erosion and their prevention; examples of oil cavitation erosion in positive displacement pumps; microscopic investigation of cavitation erosion damage in metals; lubricant pressure rippling in dynamic Hertzian contacts induced by surface roughness; asperity lubrication and cavitation in face seals; effect of cavitation on fluid stability in polymer thickened fluids and lubricants; effects of viscoelasticity on cavitation in drag reducing fluids; progress and problems in erosion prediction; potential of thin, sputtered films as erosion resistant protective coatings; rain droplet erosion mechanism of reports presents current business and economic developments in every country that offers a present or potential market for United States goods. The reports include a summary of the prospective impact on the United States economy, changing trade patterns prospective business trends, balance of payments, government policies, and investments. For individual country reports, order by COM-number listed below:

CONF-7206100-3 PC$3.00/MF$1.45
Deutsche Forschungs- und Versuchsanstalt fuer Luft- und Raumfahrt E. V., Porz-Wahn (F.R. Germany). Inst. Fuer Werkstoff-Forschung.
EFFECT OF TYPE OF PRODUCT ON THE HIGH TEMPERATURE STRENGTH OF A DISPERSION HARDENED TUNGSTEN ALLOY FOR USE AS FIBER REINFORCEMENT.
G. Wirth. 1972, 19p

Descriptors: (*Tungsten base alloys, *Mechanical properties), (*Rhenium alloys, Mechanical properties), (*Thorium oxides, Mechanical properties), Creep, Dispersion hardening, Recrystallization, Reinforced materials, Rods, Ruptures, Sheets, Very high temperature, Wires.

For abstract, see NSA 29 12, number 30077.

COO-3158-28 PC$4.25/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa).
DEFECTS IN METAL CRYSTALS. PROGRESS REPORT, MAY 1, 1973--APRIL 30, 1974.
R. W. Balluffi, and D. N. Seidman. 1974, 22p
Contract AT(11-1)-3158

Descriptors: (*Tungsten, *Physical radiation effects), (*Gold, *Grain boundaries), (*Platinum alloys, Physical radiation effects), (*Gold alloys, Physical radiation effects), Annealing, Crystal defects, Electron beams, Gold ions, Interstitials, Ion beams, Ion microscopy, Molybdenum, Nickel alloys, Point defects, Research programs, Screw dislocations, Tungsten alloys, Tungsten ions, Xenon ions.

For abstract, see NSA 29 12, number 30149.

EGG-1183-2274 PC$5.45/MF$1.45
Eg and G, Inc., Goleta, Calif. (Usa).
SPALL DATA COMPENDIUM.
J. A. Charest. Aug 72, 73p

Descriptors: (*Solids, *Fracture properties), (*Aluminium, Fracture properties), (*Beryllium, Fracture properties), (*Tantalum, Fracture properties), Aluminium alloys, Carbon, Data, Graphite, Tables, Titanium, Titanium base alloys, Vanadium alloys.

For abstract, see NSA 29 12, number 30080.

HEDL-SA-648 PC$3.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
EFFECT OF STRAIN RATE AND TEMPERATURE ON THE TENSILE PROPERTIES OF TYPE 308 SMA WELD METAL.
J. M. Steichen. Aug 73, 9p CONF-740508-1
Contract AT(45-1)-2170

Descriptors: (*Stainless steel-308, Welded joints), (*Welded joints, *Physical radiation effects), Aging, Deformation, Ductility, High temperature, Neutron beams, Temperature dependence, Tensile properties.

For abstract, see NSA 29 12, number 30081.

IS-T-618 PC$8.00/MF$1.45
Ames Lab., Iowa (Usa).
SURFACE STRUCTURES FROM THE INTERACTION OF AMMONIA WITH TUNGSTEN.
D. L. Summers. Apr 74, 98p
Contract W-7405-eng-82

Descriptors: (*Tungsten, *Metallography), Ammonia, Electron diffraction, Monocrystals, Nitrogen, Surfaces.

For abstract, see NSA 29 12, number 30045.

KFK-1925 PC$5.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Material- und Festkoerperforschung.
CREEP-RUPTURE BEHAVIOR OF INCONEL 625 IN THREE DIFFERENT PRETREATMENTS.
M. Schirra. Feb 74, 50p
In German.

Descriptors: (*Inconel 625, *Mechanical properties), Creep, Fabrication, Heat treatments, Precipitation, Ruptures.

For abstract, see NSA 29 12, number 30083.

NRL-7660 PC$4.00/MF$1.45
Naval Research Lab., Washington, D.C. (Usa).
AUGER ELECTRON SPECTROSCOPY ANALYSIS OF THE FRACTURE SURFACES OF IRRADIATED PRESSURE-VESSEL STEELS.
F. A. Jr. Smidt, D. F. Stein, and A. Joshi. 21 Dec 73, 12p
Contract AT(49-5)-2110

Descriptors: (*Steel-astm-a302, *Radiation effects), (*Steel-astm-a533, Radiation effects), (*Welded joints, Radiation effects), Auger electron spectroscopy, Copper, Embrittlement, Phosphorus, Segregation.

For abstract, see NSA 29 12, number 30152.

PAT-APPL-438 906 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
METHOD OF DESORBING GOLD FROM ACTIVATED CARBON.
Patent Application,
J. Richard Ross. Filed 1 Feb 74, 9p
DOCKET/MIN-2114
Government-owned invention available from licensing. Copy of application available NTIS.

Descriptors: *Gold, *Desorption, *Activated carbon, *Patent applications, Cyanides.
Identifiers: PAT-CL-75-103.

In the patent application, gold in the form of its cyanide complex is desorbed from activated carbon by contacting the carbon with a stripping liquid at temperatures above about 130C but below the decomposition temperature of the gold cyanide complex. The stripping liquid may comprise water, dilute caustic or dilute caustic cyanide.

PB-232 545/6GA PC$4.00/MF$1.45
National Materials Advisory Board (NAS-NAE), Washington, D.C.
DIRECT REDUCTION PROCESSES FOR THE PRODUCTION OF TITANIUM METAL.
Final rept.
Mar 74, 91p* NMAB-304
Contract GS-OO-DS-(P)-94008

Descriptors: *Titanium, *Extractive metallurgy, *Reduction(Chemistry), Electrowinning, Economic analysis.
Identifiers: Carbothermic reduction, Titanium sponge material.

Existing technology was reviewed with the aid of individuals currently and formerly associated with the titanium metal industry. Reduced demand for titanium metal after 1957 adversely affected the titanium metal producing industry in the United States. Currently, of the titanium metal consumed domestically, 30 percent is imported. The domestic producers, as well as the major foreign producers, use the Kroll (magnesium) or Hunter (sodium) technology developed in the United States. The development of new technology to produce pure titanium metal at a lower cost is important because of (1) economic aspects of commercial markets, and (2) strategic aspects of domestic production. While no essentially new technology appears imminent, areas for development in research and production are identified. Process improvements are needed if titanium, relative to other metals, is to attain an improved competitive position for large tonnage use.

PB-232 882/1GA PC$3.00/MF$1.45
Stanford Univ., Calif. Dept. of Applied Mechanics.
ANALYSIS OF DYNAMIC DEFORMATION OF A POROUS MEDIUM.
Interim technical rept. Mar 73-May 74,
E. H. Lee, R. L. Mallett, T. C. T. Ting, and W. H. Yang. May 74, 19p SUDAM-74-3 DOT-TST-74-18
Contract DOT-OS-30091

Descriptors: *Deformation, *Dynamic loads, *Porous metals, Stress strain relations, Elastic properties, Numerical analysis.

The average or macroscopic stress-strain characteristics of a porous medium are deduced from an analysis of the microscropic deformation adjacent to the pores. The porous medium is considered to be manufactured from a ductile metal matrix. An appropriate deformation problem for a single cell surrounding a cavity is generated and solved for elastic-plastic material response, and this determines the overall response of the medium. Even when the matrix metal itself is not rate sensitive, the inertia associated with the microscropic motion during cavity deformation and collapse under compressive loads can introduce a strain-rate influence on the average or macroscopic stress. This effect is evaluated, and shown to be negligible for loading rates comparable to those occurring in automobile collisions, so that a much simpler quasi-static analysis is satisfactory for such applications. Comparison with related work is discussed.

RD/B/N-2804 PC$4.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
USE OF ENERGY DISPERSIVE X-RAY ANALYSIS IN THE STUDY OF LIQUID SODIUM CORROSION AND DEPOSITION PROCESSES.
A. J. Hooper, and S. B. Fisher. Nov 73, 20p

Descriptors: (*Chromium alloys, *Corrosion), (*Nickel base alloys, Corrosion), (*Stainless steel-316, Corrosion), (*Stainless steels, Corrosion), Chemical composition, Corrosion products, Corrosive effects, Deposition, Electron microscopy, Incoloy 800, Iron base alloys, Liquid flow, Liquid metal cooled reactors, Liquid metals, Mass transfer, Nimonic pe16, Particles, Quantitative chemical analysis, Sodium, Surfaces, X-ray spectra.

For abstract, see NSA 29 12, number 30049.

RD/B/N-2848 PC$4.25/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
INFLUENCE OF STRESS AND STRAIN UPON THE CARBURISATION OF AISI 316 STAINLESS STEEL IN SODIUM AT 450 EXP 0 C.
W. Charnock, and D. J. Bull. Dec 73, 25p
CFR/SMWP/P-(73)91

Descriptors: (*Stainless steel-316, *Carburization), (*Sodium, *Corrosive effects), Elasticity, Microstructure, Notches, Strains, Stresses.

For abstract, see NSA 29 12, number 30050.

WAPD-TM-1048 PC$4.25/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
IODINE STRESS CORROSION CRACKING OF ZIRCALOY-4 TUBING (LWBR DEVELOPMENT PROGRAM).
J. G. Weinberg. Feb 74, 23p
Contract AT(36-1)-GEN-14

Descriptors: (*Zircaloy 4, *Stress corrosion), (*Iodine, *Corrosive effects), (*Thorium oxides, *Metallurgical effects), Cracking, Failures, Tubes, Vapors.

For abstract, see NSA 29 12, number 30051.

11G. Miscellaneous Materials

AD-779 943/0GA PC$7.00/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
MATERIAL SELECTION AND TESTING FOR THERMAL RADIATION SHIELDING.
Master's thesis,
Frank J. Vondersaar. Mar 74, 79p Rept no. GNE/PH/74-9

Descriptors: *Heat shields, Ablative materials, Nuclear explosions, Radiation shielding, Coatings, Aircraft, Computer programs, Thermal insulation, Polymers, Ceramic materials, Titanium, Alumina, Heat transfer, Zirconium oxides, Silicones, Cork, Phenolic plastics, *Teflon, Graphite, Silicon dioxide, Theses.
Identifiers: Design.

The report includes procedures for selection and testing of advanced thermal protection materials for use on an absorptive, lightweight, thermal radiation flash shield to protect aircraft crews from a nuclear weapon thermal pulse. Included are a survey of thermal protection systems and materials, techniques for simulation of a nuclear weapon thermal pulse, testing procedures and equipment description, heat transfer theory and a computer code developed to model the flash shield. The code uses an implicit numerical solution method to solve the one-dimension, transient, heat conduction equation for a multilayer slab. Also shown in the report are results of testing and a final optimal shield design, with weight, cost, and safety information for the proposed shield. (Author)

PB-232 890/4GA PC$5.00/MF$1.45
California State Div. of Highways, Sacramento. Transportation Lab.
FURTHER EVALUATION OF DEICING CHEMICALS.
Highway research rept. (Final),
Richard F. Stratfull, Donald L. Spellman, and Joseph A. Halterman. Jan 74, 37p CA-DOT-TL-5197-2-74-01

Descriptors: *Deicers, *Corrosion, *Reinforcing steels, *Skid resistance, Reinforced concrete, Bridge decks, Potassium phosphates, Formates.
Identifiers: Sodium formates.

Severe corrosion of reinforcing steel and concrete deterioration in reinforced concrete bridge decks caused by salt applied to the decks to control ice and snow has prompted a search for a noncorrosive deicing chemical suitable for maintenance use. Seventeen candidate chemicals have been evaluated. Tetrapotassium pyrophosphate (TKPP) exhibited good frost preventing properties and two years of limited field testing on bridge decks is reported. A skidding car method of coefficient of friction is presented. The test results of sodium formate used as a deicer and its detrimental effect on concrete is evaluated.

11H. Oils, Lubricants, and Hydraulic Fluids

AD-779 807/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE EFFECT OF THE ELECTRIC FIELD ON SOME ELECTROPHYSICAL PROPERTIES OF TRANSFORMER OILS.
N. Sh. Memmedov, R. Sh. Guliev, and G. T. Musaev. 3 May 74, 8p Rept no. FTD-HC-23-1253-72
Edited trans. of Azerbaidzhanskoe Neftyanoe Khozyaistvo (USSR) v48 n8 p43-44 1969.

Descriptors: *Oils, Transformers, Dielectric properties, Oxidation, Deterioration, Electric fields, Translations, USSR.
Identifiers: *Insulating oil.

The investigation examined transformer oils obtained from distilled Buzovna crude oil using adsorption and pickling methods. The electrical field was applied for 44 hours and the oil temperature was 100C.

PATENT-3 425 971 Not available NTIS
Department of Agriculture, Washington, D.C.
SALT-RESISTANT THICKENERS COMPRISING BASE-SAPONIFIED STARCH-POLYACRYLO-NITRILE GRAFT COPOLYMERS.
Patent, *Filed 2 Mar 66, patented 4 Feb 69,
Lewis A. Gugliemelli, Mary Ollidene Weaver, and Charles R. Russell. 4 Feb 69, 2p PAT-APPL-531 049,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Acrylonitrile copolymers, *Starches, *Thickeners(Materials), *Saponification, Organic salts, Viscosity, Oil recovery, Polyacrylonitrile, Graft polymerization, Dispersions, Drilling fluids, Brines.
Identifiers: PAT-CL-260-17-4.

The invention relates to the base hydrolyzed (saponified) derivatives of certain starch-polyacrylonitrile graft copolymers, even very dilute aqueous solutions or dispersions of which derivatives exhibit amazingly high viscosities, even though dispersed in a 12 percent brine. The presence of only a limited sensitivity to high salt concentrations provides the saponified graft copolymers with great potential as a bodying agent for use in secondary oil recovery operations from off-shore wells.

11I. Plastics

AD-780 020/4GA PC$4.00/MF$1.45
Boston Univ Mass Dept of Aerospace Engineering
DYNAMIC PROPERTIES OF MATERIALS. PART I. POLYMERS.
Final rept.,
C. W. Jiang, and M. M. Chen. Apr 74, 88p*
AMMRC-CTR-74-22
Contract DAAG46-73-C-0181
See also Part 2, AD-780 026.

Descriptors: *Plastics, *Polymers, *Dynamic loads, Nylon, Polystyrene, Polycarbonates, Polyethylene, Polymethyl methacrylate, Polypropylene, Polyvinyl chloride, Bibliographies, Temperature, Tables(Data), Stress strain relations, Yield strength, Strain rate, Elongation, Tensile properties, Compressive properties.

A survey of literature on the mechanical behavior of polymers subject to dynamic loads in a wide temperature range has been made. The data showing the variation of yield strength, and elongation with strain rates and temperatures were tabulated and plotted; the results obtained from tension and compression modes of loading are graphed separately. A comprehensive reference section is provided. It is observed that the behavior of polymers under dynamic loading is different from static loading. The yield strengths are generally higher under dynamic loading than the static ones and they decrease with an increase of temperature. (Author)

AD-780 110/3GA PC$3.25/MF$1.45
California Univ San Diego La Jolla Dept of Applied Mechanics and Engineering Sciences
ATTENUATION AND DISPERSION CHARACTERISTICS OF VARIOUS PLASTICS IN THE FREQUENCY RANGE 1 - 10 MHZ.
Interim technical rept.,
M. P. Felix. Mar 74, 26p Rept no. TR-16 AFOSR-TR-74-0883
Grant AF-AFOSR-1957-70

Descriptors: *Plastics, *Polymers, *Ultrasonic tests, Composite materials, Polymethyl methacrylate, Phenolic plastics, Polyester plastics, Stress wave, Reinforced plastics.

It is observed experimentally that PMMA (polymethyl methacrylate) phenolic and various polyester resins exhibit little dispersion but significant frequency-dependent attenuation for dilatational waves in the frequency range 1 - 10 MHz. It is also shown that the shape of a low amplitude stress pulse propagating through a material with the above characteristics becomes significantly altered after propagating only a few cm. Thus the stress pulse distortion observed in plastic matrix-type composite materials may not be attributed to geometrical dispersion and attenuation alone; material attenuation in the matrix must be considered. The representation of these plastics by a standard linear viscoelastic solid is shown to provide an adequate model of the experimental data for the stated frequency range. (Author)

AD-780 485/9GA PC$3.00/MF$1.45
Office of Naval Research London (England)
CONFERENCE ON NEW AND IMPROVED RESIN SYSTEMS.
Conference rept.,
Irvin Wolock. 21 Dec 73, 13p Rept no. ONRL-C-24-73

Descriptors: *Polymers, *Meetings, *Scientific research, Vinyl plastics, Furan resins, Polyimide resins, Epoxy resins, Fire resistant materials, Friedel Crafts reactions, Thermosetting plastics, Silanes, Carbon fibers, Great Britain.

The Reinforced Plastics Group of the Plastics Institute sponsored a two-day conference on 'New and Improved Resin Systems' in London on 18-19 September, 1973. The purpose of the meeting was to discuss recent developments in resins and resin technology and how these are being and might be applied in practice. Among the resins discussed were fluorinated epoxies, vinyl esters, furanes, polyimides, Friedel-Crafts resins, rubber reinforced resins, and fire retardant resins. In addition, developments in silane coupling agents were discussed, and one paper was presented on studies of the effect of water on carbon fiber-rpocy composites. This report reviews some of the papers given. (Author)

COM-74-50497/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
FRACTURE TOUGHNESS TESTS OF A RIGID POLYURETHANE FOAM.
Final rept.,
Charles W. Fowlkes. Mar 74, 10p
Pub. in International Jnl. of Fracture Mechanics, v10 n1 p99-108 Mar 74.

Descriptors: *Polyurethane resins, *Foam, *Fracture toughness.

The results of some exploratory tests for determining the fracture toughness of a rigid polyurethane foam are presented. The specimen geometries used included center - and double-edge-cracked plates, the single-edge-cracked tensile specimen and the double cantilever beam specimen. The validity of applying the concepts of linear elastic fracture mechanics to the fracture of this foam material is discussed. Some unique features of the fracture of foam are discussed.

PATENT-3 405 880 Not available NTIS
Department of Agriculture, Washington, D.C.
PROCESS FOR PREPARING POLYETHER-POLY-URETHANE-STARCH RESINS.
Patent, *Filed 7 Oct 65, patented 8 Oct 68,
Felix H. Otey, Florence L. Bennett, and Charles L. Mehltretter. 8 Oct 68, 2p PAT-APPL-493 938,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Polyurethane resins, *Polyether resins, *Molding techniques, *Hot pressing, Hardness, Starches, Diisocyanates, Curing, Crosslinking, Machinability, Pressure.
Identifiers: PAT-CL-260-9.

The invention relates to novel starch-containing, pressure-molded polyether-polyurethane resins. Low cost smoothly machinable polyether-urethane parts for small machines, chair legs, and the like are obtained by pressure molding an unfoamed diisocyanate modified glycol glycoside polyether prepolymer of which prepolymer about one-half to about two-thirds of the total weight represents directly added granular starch.

PATENT-3 787 220 Not available NTIS
Department of Agriculture, Washington, D.C.
MOLDED ARTICLES AND FILMS.
Patent, *Filed 24 Jan 73, patented 22 Jan 74, George G. Maher. 22 Jan 74, 12p PAT-APPL-326 220,
Previously filed as PAT-APPL-190 319, 18 Oct 71.
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Crosslinking, *Molding techniques, *Epoxy compounds, Plasticizers, Alkoxy compounds, Ethers.
Identifiers: PAT-CL-106-214, Butane/diepoxy, Butane/bis(epoxypropoxy), *Starch xanthates.

The invention relates to the preparation of molded articles and films prepared from cross-linked starch xanthate. Hard products which retain the shape of a mold were formed when sodium starch xanthate having a xanthate D.S. (degree of substitution) of from about 0.05 to about 0.60 was reacted with an excess of an alkyl diglycidyl ether such as 1.4-butanediol diglycidyl ether or an alkyl diepoxide such as butadiene diepoxide in an alkaline aqueous medium. Placticizers were added. The reaction was conducted in a mold for a time sufficient to allow formation of a solid mass.

11J. Rubbers

PATENT-3 673 136 Not available NTIS
Department of Agriculture, Washington, D.C.
POWDERED POLYSACCHARIDE-REINFORCED ELASTOMER MASTERBATCHES, COMPOUNDS, AND RESULTING VULCANIZED RUBBERS.
Patent, *Filed 24 Jul 70, patented 27 Jun 72, Russell A. Buchanan, and Charles R. Russell. 27 Jun 72, 7p PAT-APPL-58-187,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Vulcanized elastomers, *Powder(Particles), *Polysaccharides, Compression molding, Phase transformations, Grinding(Comminution), Precipitation(Chemistry).
Identifiers: PAT-CL-260-17-4-BB.

The invention relates to powdered elastomer compositions from which vulcanized rubber can be directly prepared. The authors have discovered a method for making powdered polysaccharide-reinforced elastomer masterbatches. The method comprises coprecipitating polysaccharides with elastomers, drying the coprecipitates, and comminuting the coprecipitates. Storage-stable, readily curable, powdered polysaccharide-reinforced rubber compounds can be made by blending powdered polysaccharide-reinforced elastomer masterbatches with normally used rubber curatives. Fillers and extenders such as clay, highly reinforcing silica, or carbon black can be incorporated in the rubber compounds. Shaping and molding are accomplished by the combined action of heat and compression on the powder.

11L. Wood and Paper Products

PB-232 377-T/GA PC$4.00/MF$1.45
Building Research Establishment, Watford (England).
ASSESSMENT OF THE TOXICITY OF SOME COPPER, ZINC, AND BORON BASED WOOD PRESERVATIVES TO THE CELLAR FUNGUS CONIOPHORA CEREBELLA SCHROET (OTSENKA TOKSICHNOSTI NEKOTORYKH ANTISEPTIKOV NA OSNOVE MEDI, TSINKA I BORA DLYA PLENCHATOGO DOMOVOGO GRIBA CONIPHORA CEREBELLA SCHROET),
V. N. Sozonova, and D. A. Belenkov. Feb 74, 8p Library Trans-1814
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Lesnoi Zhurnal (USSR) n1 p102-106 1972.

Descriptors: *Wood preservatives, *Fungicides, *Fungus proofing, Toxicity, Fungi, Evaluation, Translations, USSR, Copper, Zinc, Boron.
Identifiers: Coniophora cerebella.

The article reports the use of a method based on the determination of the probability of the protection of timber against destruction by fungi. By converting the probability values to probit values and plotting them as a function of the amount of preservative retained in the timber, curves of the toxic effect are obtained, enabling any timber protection probability to be assessed.

PB-232 388-T/GA PC$4.00/MF$1.45
Building Research Establishment, Watford (England).
ON THE USE OF PROBIT-ANALYSIS FOR ASSESSING THE TOXICITY OF WOOD PRESERVATIVES (O PRIMENIMOSTI PROBIT-ANALIZA DLYA OTSENKI TOKSICHNOSTI ANTISEPTIKOV NA DREVESINE),
D. A. Belenkov. Feb 74, 6p Library Trans-1816
Trans. of Izvestiya Vysshikh Uchebnykh Zavedenii. Lesnoi Zhurnal (USSR) n2 p83-86 1968.

Descriptors: *Wood preservatives, *Fungicides, *Fungus proofing, Toxicity, Evaluation, Fungi, USSR, Translations.
Identifiers: Coniophora cerebella.

The author investigated the toxicity to Coniophora of sodium fluoride, sodium chloride and sodium silicofluoride, copper sulphate, zinc chloride, ammonium fluoride and ammonium pentaborate. The change of reaction of Coniophora in timber containing different amounts of NaF is well described by an S-shaped curve, similar to the integral function of a normal distribution. Similar graphs are also obtained when testing other preservatives. The nature of the curve shows yet again that different probit-analysis methods may be used when testing preservatives in timber. The proposed method gives an overall picture of the protection of the timber by a specific preservative against the action of wood-destroying fungus and enables the amount of toxic material, which should be selected for a more detailed investigation by the previously reported procedure, to be determined.

PB-232 862/3GA PC$5.75/MF$1.45
Western Forest Products Lab., Vancouver (British Columbia).
PRESENT AND FUTURE USES OF CANADIAN POPLARS IN FIBRE AND WOOD PRODUCTS.
Information rept.,
J. L. Keays, J. V. Hatton, G. R. Bailey, and R. W. Neilson. Apr 74, 55p VP-X-120

Descriptors: *Wood products, *Poplar wood, *Canada, Wood pulp, Plywood, Wood particle boards, Fiberboards, Paper products, Estimates, Utilization, Trends, Lumber, Volume, Drying, Paper industry.
Identifiers: Populus tremuloides, Populus balsami, Populus trichocarpa.

In spite of the large volumes and wide distribution of poplars in Canada, only a small proportion is commercially used. The report reviews the present use of poplars for pulp and paper, fibreboards, lumber, plywood and particleboard, and evaluates the future potential for greater utilization of poplars in these products. Pulp and paper accounts for the greatest volume of poplars consumed in Canada at present and also has the greatest potential for poplar use. Research on the mechanical pulping of poplars for newsprint is needed if this long-term potential is to realized. Manufacturers of particleboard, plywood, fibreboard and lumber together consume about the same volume of poplar as the pulp and paper industry. All are expected increase their consumption of poplars to various degrees. An integrated approach to poplar utilization is essential. Two examples of mill compleses desinged to use the total resource are presented. (Modified author abstract)

PB-232 879/7GA PC$3.00/MF$1.45
Western Forest Products Lab., Vancouver (British Columbia).
BORON-DIFFUSION TREATMENT OF PACKAGED UTILITY-GRADE LUMBER ARRESTS DECAY IN STORAGE.
Information rept.,
J. W. Roff. Apr 74, 19p* VP-X-125

Descriptors: *Lumber, *Protective treatments, *Storage, Degradation, Termites, Fungus deterioration, Sodium borates, Diffusion, Test methods, Exposure, Packaging, Effectiveness, Wood preservatives, Canada.

Protection against spread of decay in packages of unseasoned utility-grade lumber, containing pockets of unsound wood, was attained during a 24-month test storage period using a boron-salt-diffusion process. Retentions in excess of 0.5% boric-acid equivalent were noted at the mid-sections of 1152 pieces of industrially-treated western hemlock and amabilis fir lumber following outside storage in Canada and in England. Eleven species of fungi were identified in the lumber. The treatment was also effective against a local attack by dampwood termites.

12. MATHEMATICAL SCIENCES

12A. Mathematics and Statistics

AD-779 826/7GA Reprint
Wisconsin Univ Madison Dept of Mathematics
A NOTE ON PAIRS OF SOLUTIONS OF A NONLINEAR STURM-LIOUVILLE PROBLEM,
Paul H. Rabinowitz. 10 Sep 73, 11p
Contract N00014-67-A-0128-0024
Availability: Pub. in Manuscripta Math., v11 p273-283 1974.

Descriptors: *Nonlinear differential equations, *Partial differential equations, Numerical analysis, Theorems.
Identifiers: *Sturm-Liouville theory.

Earlier qualitative theorems are used to study the structure of the set of solutions of a family of ordinary differential equations. In particular lower bounds for the number of solutions having different numbers of nodes is obtained. (Author)

AD-779 840/8GA PC$3.00/MF$1.45
Harvard Univ Cambridge Mass Center for Research in Computing Technology
ON FOURIER DIRECT METHODS FOR CONSTANT COEFFICIENT BOUNDARY VALUE PROBLEMS. DISCUSSION AND IMPLEMENTATION,
R. E. Bank. Dec 73, 18p Rept no. TR-6-74
Contract N00014-67-A-0298-0034

Descriptors: *Boundary value problems, *Fourier analysis, Matrices(Mathematics), Polynomials, Computations.
Identifiers: Tridiagonal matrices.

In the report, the author discusses the solution of the elliptic boundary value problem (Delta)u = f(x,y) on D; u = g(x,y) on (delta)D; where D is the unit square 0 < or = x, y < or = 1.

AD-779 846/5GA PC$3.00/MF$1.45
Naval Underwater Systems Center New London Conn New London Lab
SOME INTEGRALS INVOLVING THE (Q SUB M)-FUNCTION.
Technical rept.,
Albert H. Nuttall. 15 May 74, 17p Rept no. NUSC-TR-4755

Descriptors: *Integrals, *Distribution functions, Random variables, Bessel functions, Hypergeometric functions, Computations.
Identifiers: *Chi square density functions, Signal detection.

The detection probability for a nonfading signal present on M multiple observations and subjected to a quadratic combination of receiver matched-filter outputs is given by the (Q sub M)-function. In the report, several integrals of the (Q sub M-function are evaluated that aid in computing the performance in fading channels; direct numerical integration of the (Q sub M)-function, which is time-consuming, is therefore circumvented. Numerical evaluation of (Q sub M) is considered in another paper.

AD-779 860/6GA PC$3.25/MF$1.45
Brown Univ Providence R I Lefschetz Center for Dynamical Systems
A BIFURCATION PROBLEM FOR A NONLINEAR PARTIAL DIFFERENTIAL EQUATION OF PARABOLIC TYPE.
Technical rept.,
N. Chafee, and E. F. Infante. Mar 74, 39p Rept no. CDS-TR-74-5
Contract N00014-67-A-0191-0009, Grant AF-AFOSR-693-67

Descriptors: *Nonlinear Differential equations, *Partial differential equations, Banach space, *Mapping(Transformations), Theorems.
Identifiers: *Bifurcation theory, Parabolic differential equations, Lyapunov functions.

The authors consider the boundary value problem u sub t = (u sub xx) + (lambda) f(u), (0 < or = x < or = pi, 0 < t < infinity); u) sub x = 0 = u) sub x = pi = 0, (0 < or = t < infinity) (*); u) sub t = 0 = phi (x), (0 < or = x < or = pi). (Modified author abstract)

AD-779 862/2GA PC$3.00/MF$1.45
Harvard Univ Cambridge Mass Center for Research in Computing Technology
A SIMPLE PROOF FOR PARTIAL PIVOTING,
Donald J. Rose. May 74, 8p Rept no. TR-14-74
Contract N00014-67-A-0298-0034

Descriptors: *Matrices(Mathematics), Permutations, Theorems.
Identifiers: *Linear algebra.

A particularly simple, inductive proof of the PA = LU theorem of numerical linear algebra is presented. (Author)

AD-779 863/0GA PC$3.00/MF$1.45
Harvard Univ Cambridge Mass Center for Research in Computing Technology
AUTOMATIC NESTED DISSECTION,
Donald J. Rose, and Gregory F. Whitten. May 74, 13p Rept no. TR-15-74
Contract N00014-67-A-0298-0034

Descriptors: *Matrices(Mathematics), *Boundary value problems, Finite difference theory, Set theory, Graphics, FORTRAN, Algorithms, Subroutines.
Identifiers: FORTRAN 4 programming language, Finite element analysis, Graph theory, Sparse matrix.

Nested dissection is an ordering technique used to order the sparse symmetric positive definite systems of linear equations arising from discretizations to elliptic boundary value problems yielding regular n X n grids. By taking a recursive view of nested dissection an ordering strategy is developed which is particularly simple and efficient when n = 2 sup l). A FORTRAN 4 subroutine of the algorithm is included and some experiments are presented. (Author)

AD-779 889/5GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Cambridge Project Mac
FAST ON-LINE INTEGER MULTIPLICATION.
Interim scientific rept.,
Michael J. Fischer, and Larry J. Stockmeyer. May 74, 25p Rept no. MAC-TM-45
Contract N00014-70-A-0362-0006, Grant NSF-GJ-34671

Descriptors: *Computations, On line systems, Polynomials, Binary arithmetic, Recursive functions, Theorems.
Identifiers: *Turing machines, *Multiplication, MAC project.

A Turing machine multiplies binary integers on-line if it receives its inputs low-order digits first and produces the jth digit of the project before reading in the (j+1)st digits of the two inputs. The authors present a general method for converting any off-line multiplication algorithm which forms the product of two n-digit binary numbers in time F(n) into an on-line method which uses time only O(F(n) log n), assuming that F is monotone and satisfies n < or = F(n) < or = F(2n)/2 < or = kF(n) for some constant k. Applying this technique to the fast multiplication algorithm of Schonhage and Strassen gives an upper bound of O(n (log n)sup 2 loglog n) for on-line multiplication of integers. A refinement of the technique yields an optimal method for on-line multiplication by certain sparse integers. Other applications are to the on-line computation of products of polynomials, recognition of palindromes, and multiplication by a constant. (Author)

AD-780 105/3GA PC$3.75/MF$1.45
Michigan Univ Ann Arbor Dept of Aerospace Engineering
LEAST SQUARES AND LINEAR UNBIASED MINIMUM VARIANCE ESTIMATION IN EUCLIDEAN SPACE AND HILBERT SPACE.
Interim rept.,
Philip H. Fiske, and William L. Root. Jan 74, 53p Rept no. 011306 AFOSR-TR-74-0780
Grant AF-AFOSR-2328-72

Descriptors: *Least squares method, *Analysis of variance, *Estimates, *Hilbert space, Signal processing, Kalman filtering, Matrices(Mathematics), Theorems.

The estimation of an unknown vector-valued parameter in a linear model with additive noise is treated. The least-squares theory is given for the case both parameter and observation are elements of Hilbert space, and the solution is put in recursive form. A Gauss-Markov type theorem for linear unbiased minimum variance estimation is proved, again for the case both parameter and observation are elements of Hilbert space, and the solution is put in recursive form for the finite-dimensional case only. A modification of the linear unbiased minimum variance estimate which accounts for some prior information is given. (Author)

AD-780 173/1GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
UNIFORM ASYMPTOTIC SOLUTION OF EIGENVALUE PROBLEMS FOR CONVEX PLANE DOMAINS.
Joseph B. Keller, and Daljit S. Ahluwalia. 29 Aug 72, 12p Rept no. SI-4
Contract N00014-67-A-467-0027, Grant AF-AFOSR-2107-71
Availability: Pub. in SIAM Jnl. Applied Mathematics, v25 n4 p583-591 Dec 73.

Descriptors: *Potential theory, *Ray tracing, Matrices(Mathematics), Convex sets.
Identifiers: Caustics, Eigenvalues, Laplace equation, Airy function.

The ray method of Keller and Rubinow determines asymptotically certain of the large eigenvalues and corresponding eigenfunctions of the Laplace operator in convex domains, but the expression for each eigenfunction is singular at a certain caustic of the rays. The authors obtain uniform asymptotic expansions of these eigenfunctions in the two-dimensional case, and improved expressions for the eigenvalues, by using the uniform expansion of Kravtsov and Ludwig. (Modified author abstract)

AD-780 182/2GA PC$4.00/MF$1.45
Purdue Univ Lafayette Ind Dept of Statistics
SOME CONTRIBUTIONS TO THE THEORY OF PARAMETRIC AND NONPARAMETRIC SEQUENTIAL RANKING AND SELECTION.
Technical rept.,
Raymond James Carroll. May 74, 90p Rept no. Mimeograph Ser-359
Contract N00014-67-A-0226-0014

Descriptors: *Sequential analysis, *Sampling, Decision theory, Selection, Distribution functions, Approximation, Theorems.
Identifiers: *Parametric statistics, *Nonparametric statistics, Ranking, Statistical inference.

AD-780 183/0GA PC$3.00/MF$1.45
Purdue Univ Lafayette Ind Dept of Statistics
ESTIMATING A DENSITY AT AN UNKNOWN POINT.
Technical rept.,
Raymond James Carroll. May 74, 21p Rept no. Mimeograph Ser-360
Contract N00014-67-A-0226-0014
Sponsored in part by National Science Foundation, Washington, D.C.

Descriptors: *Sampling, *Distribution functions, *Estimates, Theorems.

AD-780 184/8GA PC$3.00/MF$1.45
Purdue Univ Lafayette Ind Dept of Statistics
SOME RESULTS RELATING TO PROBABILITIES OF RANKINGS OF K(> OR = 2) POPULATIONS WITH APPLICATIONS.
Technical rept.,
Raymond J. Carroll, and Shanti S. Gupta. May 74, 18p Rept no. Mimeograph Ser-361
Contract N00014-67-A-0226-0014

Descriptors: *Sampling, *Normal density functions, Probability, Permutations, Theorems.
Identifiers: Ranking.

AD-780 185/5GA PC$3.00/MF$1.45
Purdue Univ Lafayette Ind Dept of Statistics
ON SUBSET SELECTION PROCEDURES FOR THE T BEST POPULATIONS.
Technical rept.,
Shanti S. Gupta, and Deng-Yuan Huang. May 74, 10p Rept no. Mimeograph Ser-362
Contract N00014-67-A-0226-0014

Descriptors: *Sampling, *Selection, Decision theory, Set theory, Probability density functions, Random variables, Theorems.
Identifiers: *Ranking.

In the paper, the authors are interested in deriving a procedure which selects a random size subset containing all the t best populations, with a probability not less than P*, a specified constant.

AD-780 187/1GA Reprint
Utah Univ Salt Lake City Dept of Mathematics
BOUNDED OSCILLATIONS OF LINEAR AND NONLINEAR DELAY-DIFFERENTIAL EQUATIONS OF EVEN ORDER,
G. B. Gustafson. Nov 71, 17p AROD-9157.3-M
Grant DA-ARO-D-31-124-71-G146
Availability: Pub. in Jnl. of Mathematical Analysis and Applications, v46 n1 p175-189 Apr 74.

Descriptors: *Linear differential equations, *Nonlinear differential equations, Time lag theory, Oscillation, Theorems.

The second order linear delay-differential equation y double prime(t) + q(t)y(g(t)) = 0 with q(t) > or = 0, g(t) < or = t, g(t) nears infinity as t nears infinity has been investigated by a number of authors. The present paper is concerned with the case q(t) < or = 0, say q(t) = -p(t). The paper develops oscillation criteria for delay-differential equations which depends in a qualitative manner on the initial function, and so explicitly involves the delay that the criteria never applies to ordinary equations. Further, the techniques used are not limited to linear equations or to second-order equations. Finally, it is shown that the results are not limited to delays which are nondecreasing or coefficient functions which are one-signed.

AD-780 196/2GA PC$5.00/MF$1.45
Princeton Univ N J Dept of Statistics
STATIONARY MEASURES FOR MULTITYPE BRANCHING PROCESSES.
Technical rept.,
Fred Hoppe. Apr 74, 39p Rept no. TR-57-Ser-2
Contract N00014-67-A-0151-0017
See also AD-780 178.

Descriptors: *Statistical processes, Invariance, Measure theory, Theorems.
Identifiers: *Galton-Walton process, *Branching processes, Existence theorems, Uniqueness theorems.

The multitype Galton-Watson process is considered both with and without immigration. Proofs are given for the existence of invariant measures and their uniqueness is examined by functional equation methods. (Author)

AD-780 198/8GA PC$4.00/MF$1.45
Princeton Univ N J Dept of Statistics
A NOTE ON THE BEHAVIOR OF THE STABLE DISTRIBUTIONS FOR SMALL INDEX ALPHA.
Technical rept.,
Noel Cressie. May 74, 17p Rept no. TR-60-Ser-2
Contract N00014-67-A-0151-0017

Descriptors: *Distribution functions, Random variables, Exponential functions, Theorems.
Identifiers: Exponential density functions.

AD-780 245/7GA PC$3.25/MF$1.45
New Mexico Univ Albuquerque Dept of Mathematics and Statistics
INDEPENDENCE, ESSENTIAL INDEPENDENCE AND ZERO CORRELATION OF TWO RANDOM VARIABLES CONDITION ON A THIRD.
Technical rept.,
C. R. Crain, Jr. May 74, 40p Rept no. TR-293
Contract N00014-68-A-0155-0003

Descriptors: *Random variables, *Correlation techniques, Regression analysis, Integrals, Probability, Measure theory, Theorems.

In the paper the author defines, for constant regression (which is called essential independence) and zero correlation, analogues of Bell and Zimmer's seven conditions. The author then extends and modifies their results. A salient point of the dissertation is that there are several seemingly distinct but logically equivalent ways of expressing constant regression. This equivalence connects local and global (averaging) probabilities. There is no similar observation to be made for zero correlation. On the other hand, there is an analogous, and even richer, collection of equivalent conditions for independence. This fact has been exploited by Bell and Zimmer and is adapted here. (Modified author abstract)

AD-780 309/1GA Reprint
Pennsylvania State Univ University Park
DISCRIMINATION BETWEEN THE LOG-NORMAL AND THE WEIBULL DISTRIBUTIONS,
Robert Dumonceaux, and Charles E. Antle. Mar 71, 6p ARL-74-0092
Contract F33615-71-C-1169
Prepared in cooperation with St. Johns Univ., Collegeville, Minn. Revision of report dated May 70.
Availability: Pub. in Technometrics, v15 n4 p923-926 Nov 73.

Descriptors: *Weibull density functions, Random variables, Estimates, Sampling.
Identifiers: *Lognormal density functions, Maximum likelihood estimation.

The log-normal and the Weibull are often considered for situations in which a skewed distribution for a non-negative random variable is needed. The ratio of maximized likelihoods provides a good test for selecting one of these. A table of the necessary critical values is given. The table may also be used for discriminating between the normal and the type 1 extreme value distributions. (Author)

AD-780 343/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CONVERGENCE RATE ESTIMATES FOR POLYA-JACKSON PROCESS FOR CONTINUOUS POLYNOMIALS UNDER ADDITIONAL STRUCTURAL CONDITIONS,
E. Ya. Remez. 24 May 74, 11p Rept no. FTD-HT-23-1172-74
Edited trans. of Akademiya Nauk SSSR. Doklady, v58 n8 p1601-1604 1947, by Marilyn Olaechea.

Descriptors: *Polynomials, *Convergence, *Estimates, Theorems, Translations, USSR.
Identifiers: Polya theorem, Jackson theorem.

AD-780 349/7GA Reprint
Air Force Weapons Lab Kirtland AFB N Mex
FORECASTING USING EQUATIONS WITH SMOOTHED COEFFICIENTS,
Arthur R. Geldbach, and A. W. Wortham. 1973, 13p Rept no. AFWL-TR-74-506
Availability: Pub. in The Logistics and Transportation Review, v9 n3 p253-262 1973.

Descriptors: *Time series analysis, *Mathematical prediction, *Forecasting, Estimates, Transformations(Mathematics).
Identifiers: Exponential smoothing.

A forecasting model is developed which uses exponential smoothing to predict the coefficients of an equation to be used for predicting future demand. The developed techniques can be applied in more complex equations and in generalized inventory systems. (Author)

AD-780 371/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
LIMITING POLYA-JACKSON-JULIA TRANSITION AND SOME CORRESPONDING INTERPOLATION ALGORITHMS,
S. Ya. Remez. 24 May 74, 13p Rept no. FTD-HT-23-1171-74
Edited trans. of Akademiya Nauk SSSR. Doklady, v58 n9 p1901-1904 1947, by Marilyn Olaechea.

Descriptors: *Interpolation, *Approximation, *Polynomials, Translations, Theorems, Algorithms, USSR.
Identifiers: Polya theorem, Jackson theorem.

AD-780 400/8GA Reprint
California Univ Berkeley Electronics Research Lab
ZEROS AND POLES OF MATRIX TRANSFER FUNCTIONS AND THEIR DYNAMICAL INTERPRETATION,
Charles A. Desoer, and Jerry D. Schulman. 15 May 73, 9p AFOSR-TR-74-0842
Contract F44620-71-C-0087, Grant NSF-GK-10656
Revision of report dated 10 Nov 72.
Availability: Pub. in IEEE Transactions on Circuits and Systems, vCAS21 n1 p3-8 Jan 74.

Descriptors: *Matrices(Mathematics), *Transfer functions, Polynomials, Control theory, Theorems.

Many researchers have discussed the concept of zeros of matrix transfer functions. Some have defined 'zeros of multivariable systems' to be zeros of the scalar rational functions which are elements of the matrix transfer function. Except for the special case of a diagonal matrix transfer function, such 'zeros' have nothing to do with the concept of zeros to be introduced here. The purpose of the paper is to show that zeros of matrix transfer functions can be defined in a way quite analogous to the scalar case and that the zeros thus defined have analogous characterization.

AD-780 402/4GA Reprint
California Univ Berkeley Electronics Research Lab
INSTABILITY OF FEEDBACK SYSTEMS BY ORTHOGONAL DECOMPOSITION OF (L SUB 2),
Shoichi Takeda, and Arthur R. Bergen. 28 Feb 73, 8p AFOSR-TR-74-0844
Contract F44620-71-C-0087
Availability: Pub. in IEEE Transactions on Automatic Control, vAC18 n6 p631-636 Dec 73.

Descriptors: *Control theory, Feedback, Instability.

A useful method for investigating the (L sub 2) instability of the feedback interconnection of a linear unstable subsystem G and a nonlinear stable subsystem N is to resolve (L sub 2) into two orthogonal spaces on the basis of the input-output behavior of G. This yields insight and permits simple proofs of various instability counterparts to stability theorems. (Author)

AD-780 457/8GA PC$3.00/MF$1.45
Wisconsin Univ Madison Dept of Statistics
STATISTICAL AND THE ENVIRONMENT.
Technical rept.,
G. E. P. Box. May 74, 25p Rept no. UWIS-DS-74-366
Grant DA-ARO-D-31-124-72-G162
Presented at the Symposium on Statistics and the Environment, by the National Academy of Sciences, Washington, D.C., on 6-8 Mar 74.

Descriptors: *Statistical analysis, *Environments, Learning, Iterations, Time series analysis, Decision theory.

The present environmental crises has been produced by rapid growth resulting from use of science. Problems can be solved if scientific learning process is catalyzed by appropriate use of statistics. Examples are given and emphasis is placed on proper training for statisticians. (Author)

AD-780 460/2GA PC$3.25/MF$1.45
Brown Univ Providence R I Lefschetz Center for Dynamical Systems
FINITE DIFFERENCE METHODS FOR THE WEAK SOLUTIONS OF THE KOLMOGOROV EQUATIONS FOR THE DENSITY OF BOTH DIFFUSION AND CONDITIONAL DIFFUSION PROCESSES,
H. J. Kushner. Apr 74, 31p Rept no. LCDS-TR-74-6

Contract N00014-67-A-0191-0018, Grant AF-AFOSR-2078171
Sponsored in part by Grant NSF-GK-40493.

Descriptors: *Finite difference theory, *Numerical analysis, Differential equations, Stochastic processes, Measure theory, Approximation, Diffusion, Theorems.
Identifiers: Fokker-Plank equations, Kolmogorov differential equations.

The paper treats the problem of obtaining numerical solutions to the Fokker-Plank equation for the density of a diffusion, and for the conditional density, given certain 'white noise' corrupted observations. These equations generally have a meaning only in the weak sense; the basic assumptions on the diffusion are that the coefficients are bounded, and uniformly continuous, and that the diffusion has a unique solution in the same of multivariate distributions. It is shown that, if the finite difference approximations are carefully (but naturally) chosen, then the finite difference solutions to the formal adjoints, yield immediately, a sequence of approximations which converge weakly to the weak sense solution to the Fokker-Plank equation (conditional or not), as the difference intervals to to zero. (Modified author abstract)

AD-780 471/9GA Reprint
Rochester Univ N Y
A NOTE ON SELECTION PROCEDURES WITH UNEQUAL OBSERVATION NUMBERS,
E. D. Dudewicz. 29 Nov 72, 7p AROD-10003.8-M
Grant DA-ARO-D-31-124-72-G55
Prepared in cooperation with Ohio State Univ., Columbus. Div. of Statistics.
Availability: Pub. in Zastosowania Matematyki Applicationes Mathematicae, v14 p31-35 1974.

Descriptors: *Sampling, *Distribution functions, Selection, Random variables.

In a recent article Sitek generalized a selection procedure of Gupta and Sobel to the case of unequal observation numbers. An alternative approach recently given by Dudewicz and Dalal is presented for the same problem. Some suggestions for further work (numerical as well as analytical) on the case of unequal observation numbers are made.

AD-780 472/7GA Reprint
Rochester Univ N Y
ESTIMATION OF ORDERED PARAMETERS: THE RANGE OF K NORMAL MEANS,
Edward J. Dudewicz. Sep 73, 9p AROD-10003.11-M
Grant DA-ARO-D-31-124-72-G55
Prepared in cooperation with Ohio State Univ., Columbus. Revision of report dated Aug 73.
Availability: Pub. in Communications in Statistics, v3 n3 p279-285 1974.

Descriptors: *Sampling, *Estimates, Selection, Normal density functions.
Identifiers: Ranking.

The present paper considers the problem of interval estimation of the range of a set of normal means. Such an interval can be of interest in its own right (e.g. an upper confidence interval on the range is a measure of the homogeneity of a collection of populations). Such intervals can also be regarded as a preliminary stage of data analysis (e.g. if the range of the mean yields is shown to be very small, then in certain applications one would not proceed further with experimentation, but would decide to choose a population on criteria other than mean yield such as cost, ease of implementation, etc.; while if the range is large one may follow with ranking and selection procedures and/or estimation of ordered parameters). (Modified author abstract)

AD-780 473/5GA Reprint
Princeton Univ N J
KORTEWEG-DEVRIES EQUATION AND GENERALIZATIONS. VI. METHODS FOR EXACT SOLUTION,
Clifford S. Gardner, John M. Greene, Martin D. Kruskal, and Robert M. Miura. Oct 73, 39p
Contract F44620-70-C-0033
Prepared in cooperation with New York Univ., N.Y., Courant Inst. of Mathematical Sciences Grant AF-AFOSR-2053-71 and Grant NSF-GP-34319, and Vanderbilt Univ., Nashville, Tenn. See also Part 5, AD-706 943.
Availability: Pub. in Communications on Pure and Applied Mathematics, v27 p97-133 1974.

Descriptors: *Nonlinear differential equations, *Partial differential equations, *Numerical integration, Wave equations, Theorems.
Identifiers: *Korteweg-deVries equation, Eigenvalues.

In a previous paper the authors announced a method for exact solution of the Korteweg-deVries equation (KdV for short) (u sub t) + u(u sub x) + (u sub xxx) = 0. This is a nonlinear partial differential equation that describes the long-time evolution of small-amplitude long-wavelength dispersive (nondissipative) waves. Here the authors give more details of that method and present further results on properties of the solutions.

AD-780 474/3GA Reprint
California Univ Berkeley Electronics Research Lab
THE IDENTIFICATION OF A SET BY SUCCESSIVE INTERSECTIONS.
Interim rept.,
A. Gill, and D. Gottlieb. 19 Apr 73, 19p AFOSR-TR-74-0847
Contract F44620-71-C-0087, Grant NSF-GJ-31734
Revision of report dated 2 Aug 72.
Availability: Pub. in Information and Control, v24 n1 p20-35 Jan 74.

Descriptors: *Set theory, Selection, Decision theory, Algorithms.
Identifiers: Intersections(Set theory).

The paper is concerned with the identification of an unknown subset S of a known set A by selecting a sequence A1, A2, A3,..., of subsets of A and establishing, after each selection, whether or not S intersection (A sub k) is empty. The central problem is to devise a selection algorithm which would result in correct identification of S with the least expected number of (A sub k's). The main result of the paper is a selection algorithm which, under certain conditions, is considerably superior to the 'naive selection algorithm' (where each (A sub k) consists of a different element of A), and whose performance is quite close to an upper bound arrived at via information-theoretic consideration. (Modified author abstract)

AD-780 481/9GA Reprint
Pennsylvania State Univ University Park Dept of Statistics
MAXIMUM LIKELIHOOD ESTIMATION WITH THE WEIBULL MODEL,
Howard Rockette, Charles Antle, and Lawrence A. Klimko. Jun 73, 6p ARL-74-0086
Contract F33615-71-C-1169
Prepared in cooperation with Pittsburgh Univ., Pa. Graduate School of Public Health. Revision of report dated Oct 72.
Availability: Pub. in Jnl. of the American Statistical Association, v69 n345 p246-249 Mar 74.

Descriptors: *Weibull density functions, *Sampling, *Estimates, Theorems.
Identifiers: *Maximum likelihood estimation, Parameter estimation.

Some of the questions concerning the uniqueness of the maximum likelihood estimates for the parameters in the Weibull distribution are considered for both censored and noncensored samples. In some cases answers previously known are reviewed, while new results are presented for some other cases. In particular, it is shown that with the shape parameter known, the maximum likelihood estimates of the location and scale parameters exist and are unique. Also, the case in which all three parameters are unknown is examined in detail. (Author)

COM-74-50458-01-03/GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C.
JOURNAL OF RESEARCH OF THE NATIONAL BUREAU OF STANDARDS: B, MATHEMATICAL SCIENCES. VOLUME 78B, NUMBER 1, JANUARY-MARCH 1974.
Quarterly rept.
1974, 62p NBS-JRB-78-1
Paper copy available from GPO $9.00/year as C13.22/secB:78B, $2.25/copy as C13.22/secB:78B(1).

Descriptors: *Mathematics, *Reviews, Matrices(Mathematics), Convex sets, Computer programming, FORTRAN, Arithmetic, Group theory.
Identifiers: Lyapunov functions.

Contents:
A class of positive stable matrices;
The Smith normal form of a partitioned matrix;
A Lyapunov theorem for angular cones;
Second, third, and fourth order D-stability;
Comparison of some FORTRAN programs for matrix inversion;
On characters of subgroups;
Integer arithmetic determination of polynomial real roots;
Publications of the National Bureau of Standards.

ORO-3443-46 PC$6.50/MF$1.45
Maryland Univ., College Park (Usa). Inst. For Fluid Dynamics and Applied Mathematics.
SOLUTION OF INTERFACE PROBLEMS BY HOMOGENIZATION, (PART) I.
I. Babuska. Jan 74, 70p BN-782
Contract AT(40-1)-3443

Descriptors: (*Differential equations, *Analytical solution), Boundary conditions.

For abstract, see NSA 29 12, number 31656.

PB-232 969/6GA PC$3.25/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Project MAC.
COMBINING DIMENSIONALITY AND RATE OF GROWTH ARGUMENTS FOR ESTABLISHING LOWER BOUNDS ON THE NUMBER OF MULTIPLICATIONS.
Interim scientific rept.,
Zvi M. Kedem. Jun 74, 39p MAC-TM-46
NSF/OCA-GJ34671-TM-46
Grant NSF-GJ-34671

Descriptors: *Rational functions, *Multiplication, *Division, Computation, Algorithms, Permutations.
Identifiers: MAC project, Computational complexity.

A new method for establishing lower bounds on the number of multiplications and divisions required to compute rational functions is described. The method is based on combining two known methods, dimensionality and rate of growth. The method is applied to several problems and new lower bounds are obtained.

SLA-74-5068 PC$3.25/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SYNCH SETS: A VARIANT OF DIFFERENCE SETS.
G. J. Simmons. 22p CONF-740217-1

Descriptors: (*Satellites, *Optical systems), Design, Earth planet, Group theory, Mathematics.

For abstract, see NSA 29 12, number 31612.

SLA-74-5256 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
CDC 6600 SUBROUTINES IBESS AND JBESS FOR BESSEL FUNCTIONS I/SUB NU /(X) AND J/SUB NU /(X), X GREATER THAN OR EQUAL TO 0, NU GREATER THAN OR EQUAL TO 0.
D. E. Amos, S. L. Daniel, and M. K. Weston. 20p
CONF-740511-1

Descriptors: (*Computer codes, *I codes), (*Bessel functions, Computer codes), Asymptotic solutions, Cdc computers, J codes, Power series.

For abstract, see NSA 29 12, number 31613.

SLL-74-214 PC$4.25/MF$1.45
Sandia Labs., Livermore, Calif. (Usa).
CDC 6600 ROUTINES FOR THE INTERPOLATION OF DATA AND OF DATA WITH DERIVATIVES.
R. E. Huddleston. Apr 74, 25p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *H codes), Cdc computers, Interpolation, Numerical solution, P codes.

For abstract, see NSA 29 12, number 31614.

UCRL-51517 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
CONSTRAINED MINIMIZATION OF A FUNCTION OF MANY VARIABLES.
C. W. Radcliffe, and W. J. Comfort. 24 Jan 74, 22p
Contract W-7405-eng-48

Descriptors: (*Computer codes, *Nonlinear problems), Boundary conditions, Scale invariance, Weighting functions.

For abstract, see NSA 29 12, number 31621.

12B. Operations Research

AD-779 861/4GA PC$4.00/MF$1.45
Decisions and Designs Inc Mclean Va
DECISION THEORY RESEARCH.
Technical progress rept. no. 3, 1 Sep 73-28 Feb 74,
Clinton W. Kelly, III, Camerson R. Peterson, Rex V. Brown, and Scott Barclay. 24 May 74, 76p
Contract N00014-73-C-0149, ARPA Order-2271
See also AD-757 117.

Descriptors: *Decision theory, *Meetings, Probability, Uncertainty, Decision making, Military intelligence, Threat evaluation.
Identifiers: Resource allocation, Benefit cost analysis.

A report is presented concerning research for improving human judgments of probabilities and utilities for decision making, and the application of decision theory to problems in resource allocation and policy analysis. Decision theoretic concepts are developed and procedures established for encoding uncertainties as probabilities and incorporating attitudes toward risk into utilities. An approach is developed for translating national level decision making information needs for strategic planning into requirements which have the likelihood of being satisfied under varying options of resource allocation. A methodology is developed for intelligence analyst use of credible interval assessments without the use of sophisticated computer programs. Using as a case study the recent Energy crisis, decision theory analysis is investigated as an appropriate methodology for developing optimum outcomes for various alternatives in national and international policy negotiations. The substance of recent activities for decision analysis application to problems of current and scientific intelligence is reported. Appendix I reports on three Decision Theory Workshops which were conducted in November 1973. (Author)

AD-779 891/1GA PC$6.00/MF$1.45
Massachusetts Computer Associates Inc Wakefield
DEVELOPMENT OF THEORETICAL FOUNDATIONS FOR DESCRIPTION AND ANALYSIS OF DISCRETE INFORMATION SYSTEMS. VOLUME II. MATHEMATICS.
Final rept.
20 May 74, 227p Rept no. CADD-7405-2011-Vol-2
See also report dated 20 May 74, AD-779 257.
Sponsored in part by Advanced Research Projects Agency, Arlington, Va.

Descriptors: *Integer programming, *Graphics, *Network flows, Combinatorial analysis, Set theory, Theorems.
Identifiers: *Graph theory, Directed graphs, Petri nets, Network analysis theory.

Contents:
Marked directed graphs;
Integer programming theorems for oriented graphoids;
The path graphoid of a graph and its applications to network theory;
The vertex graphoid of a bipartite graph and a sufficient condition for total unimodularity;
Deadlocks in Petri nets;
A sufficient condition for a matrix to be totally unimodular.

AD-779 929/9GA PC$4.00/MF$1.45
Northwestern Univ Evanston Ill Dept of Industrial Engineering and Management Sciences
REDUCTION AND DECOMPOSITION OF LARGE GENERALIZED GEOMETRIC PROGRAMMING PROBLEMS WITH APPLICATIONS.
Interim progress rept. 1 Mar 73-28 Feb 74,
Elmer L. Peterson, and Robert A. Abrams. 1974, 12p AFOSR-TR-74-0850
Grant AF-AFOSR-2516-73

Descriptors: *Mathematical programming, Transportation, Experimental design, Structures, Regression analysis.
Identifiers: *Geometric programming.

The problems being attacked have to do with: (1) the optimal design and operation of mechanical and electrical devices, transportation networks, and hydraulic pipelines, (2) the optimal location of facilities, (3) the analysis and optimal design of structures, and (4) certain aspects of chemical equilibrium, regression analysis, and optimal control. Some of these problems have been modeled as 'geometric programming' problems. To obtain solutions to these and other geometric programming problems, methods that reduce the complexity of the total system have been (and continue to be) developed. These methods center around the ideas of 'decomposing' the total system into smaller subsystems and reducing the dimensionality of the overall system. Several papers based on these ideas have been accepted for publication and others are being prepared for publication. (Author)

AD-779 955/4GA PC$8.25/MF$1.45
Carnegie-Mellon Univ Pittsburgh Pa Management Sciences Research Group
THE PRINCIPLES OF CUTTING-PLANE THEORY: PART I.
Research rept.,
R. G. Jeroslow. Mar 74, 101p Rept no. RR-332
Contract N00014-67-A-0314-0007

Descriptors: *Integer programming, *Nonlinear programming, Convex sets, Inequalities, Algorithms, Theorems.
Identifiers: Gomory cuts, *Cutting plane algorithms.

The paper develops a fundamental result, which reveals a construction through which all valid cutting-planes for integer programming, and other programming areas, are obtained by the use of subadditive functions in real space and their supremum directional derivatives at the origin. The fundamental result is simply a characterization theorem and does not reveal directly how to obtain cuts. The paper proceeds beyond this theorem, to develop many methods of constructing a wide variety of subadditive functions, often with special properties. When this latter work is completed, the paper shows how the general theory is adequate to account for all the well-known cutting-planes of the literature, and how the process of isolating the subadditive function 'behind' a known cutting-plane can lead to straightforward generalizations of this function, and from there on to new cutting-planes. (Modified author abstract)

AD-780 221/8GA PC$3.00/MF$1.45
Naval Weapons Center China Lake Calif
OPTIMAL CONTROL OF A QUEUEING SYSTEM WITH VARIABLE SERVICE RATES, UNCERTAIN CUSTOMER SATISFACTION, AND FINITE WAITING ROOM.
Research rept. Jan-Mar 74,
Frank C. Reed. May 74, 18p Rept no. NWC-TP-5632

Descriptors: *Queueing theory, Algorithms, Control theory, Stochastic processes, Uncertainty, Defense systems, Optimization.
Identifiers: M/M/1 queue.

The report considers optimal service policies for queueing systems in which customer satisfaction depends on the policy employed. The model has application to optimal defensive firing policies as the defense system becomes saturated. (Author)

AD-780 454/5GA PC$3.25/MF$1.45
Yale Univ New Haven Conn Dept of Administrative Sciences
ARRIVAL GENERATORS FOR QUEUEING SIMULATIONS.
Technical rept.,
George S. Fishman, and Edward P. C. Kao. Jul 74, 28p Rept no. TR-28-5
Contract N00014-67-A-0097-0028

Descriptors: *Queueing theory, *Digital simulation, Distribution functions, Estimates, Regression analysis, Sampling, Computations.
Identifiers: Goodness of fit tests.

The paper presents two methods for modeling cyclic inputs to a congested system in a discrete event digital simulation. Specifically, it is assumed that the interarrival times follow a probability distribution whose parameters are functions of time. Assuming that the conditional interarrival times follow a given underlying distribution, the mean or a function of the mean is expressed as a linear combination of harmonic components whose coefficients can be determined by stepwise regression. The results can in turn be used in generating the desired inputs for simulations. Examples based on sample data are used to illustrate the two models and to evaluate their goodness of fit. (Author)

13. MECHANICAL, INDUSTRIAL, CIVIL, AND MARINE ENGINEERING

13A. Air Conditioning, Heating, Lighting, and Ventilating

AD-780 310/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio

HIGH-SPEED STREAMS OF COMBUSTION PRODUCTS AS SOURCE OF INTENSIFIED HEATING OF METAL,
S. E. Bark, A. L. Bargauz, S. A. Lokshin, and M. A. Rozenberg. 23 May 74, 16p Rept no. FTD-HT-23-881-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) v5 p291-300 1972, by Marilyn Olaechea.

Descriptors: *Furnaces, Gas heating, Heat transfer, Convection, Gas flow, Hot gases, Steel, Billets, High intensity, Translations, USSR.
Identifiers: *Metallurgical furnaces, *Gas furnaces.

Gas furnaces with intensified convective heat exchange represent a promising method for high-speed heating of metal. They also have a low degree of heat lag and provide a good quality of heating. High-speed burners with metal air-cooled combustion chambers provide satisfactory combustion of the gas when the combustion products flow from the nozzles at stabilized rates of up to 400 m/s.

ORNL-TM-4463 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
HIGH-EFFICIENCY PARTICULATE AIR FILTERS: STATE OF THE ART SUMMARY PERTAINING TO PLUTONIA AEROSOLS.
W. Jr. Davis. Apr 74, 10p
Contract W-7405-eng-26

Descriptors: (*Air filters, *Efficiency), (*Radioactive aerosols, *Filtration), (*Plutonium, Radioactive aerosols), Air, Decontamination, Particle size, Particles, Performance testing.

For abstract, see NSA 29 12, number 29276.

PATENT-3 774 405 Not available NTIS
Department of the Air Force Washington D C
MAGNETICALLY DRIVEN CRYOGEN VUILLEUMIER REFRIGERATOR.
Patent,
Bruno S. Leo. Filed 9 Sep 71, patented 27 Nov 73, 5p Rept nos. PAT-APPL-178 866,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Refrigeration systems, *Patents, Cryogenics, Magnetic drives, Magnetic devices, Mechanical components.
Identifiers: PAT-CL-62-6, Vuilleumier cycle.

The patent describes a magnetically driven cryogenic refrigeration system. It was the Vuilleumier cycle having hot and cold gas displacer with incorporated regenerators, each displacer positioned in a cylinder and having a permanent magnet in its base, each cylinder having an electromagnet, powered by an alternating power source located at one end and a chamber connecting the hot and cold cylinders for allowing the gas to pass between them.

13B. Civil Engineering

AD-780 008/9GA PC$12.00/MF$1.45
Army War Coll Carlisle Barracks Pa
ENVIRONMENTAL QUALITY AND THE U. S. ARMY.
Group study project rept.,
Rodney E. Cox, Homer Musselman, and Robert Segal. 4 Mar 71, 176p

Descriptors: *Army, Air pollution, Water pollution, Solid wastes, Management, Environments.
Identifiers: Land use, *National Environmental Policy Act, *Environmental quality.

The quality of the environment has become a matter of concern to the majority of Americans. Recent congressional legislation and executive orders have reemphasized, redefined, and initiated certain requirements which fall within the responsibilities of the Corps of Engineers. The basic question is what actions the Corps of Engineers must initiate to comply with these new directives. Basic data were gathered using a literature search and personal interviews with personnel in the Office, Chief of Engineers. In land and water use, the Corps can make significant contributions to achieving national objectives. In solid waste management and air pollution, the contributions are considerably less because of the smaller role of the Engineers in these areas. (Modified author abstract)

AD-780 049/3GA PC$6.75/MF$1.45
Argonne National Lab Ill Energy and Environmental Systems Div
AIRPORT VICINITY AIR POLLUTION STUDY.
Final rept.,
D. M. Rote, R. W. Hecht, I. T. Wang, R. R. Cirillo, and L. E. Wangen. Dec 73, 295p* FAA-RD-73-113
Contract DOT-FA71WAI-223

Descriptors: *Airports, *Air quality, *Air pollution, Flow charting, Computerized simulation, Aircraft, Dispersing, Data acquisition, Atmospheric motion, Hydrocarbons, Nitrogen oxides, Particulates, Carbon monoxide, Commercial aviation, Civil aviation, Operation, Illinois, California.
Identifiers: Atmospheric diffusion, Aircraft exhaust, Air quality data, Air quality monitoring, Chicago(Illinois), Los Angeles(California).

The report describes the development of a computer model that can be used to determine the impact of an existing or planned airport on the air quality in its vicinity. The model development was supported by an air quality monitoring and emission activity data acquisition program. O'Hare International Airport, Chicago, Illinois, and Orange County Airport, Los Angeles, California was selected as test sites, each being representative of a predominantly commercial airport and a predominantly general aviation report, respectively. The activity simulation and air quality model are discussed. Results of the computations of air quality concentrations and comparisons with observations are presented. (Author)

AD-780 250/7GA PC$4.00/MF$1.45
Edaw Inc San Francisco Calif
FIRST ORDER CORRIDOR AVOIDANCE AREAS OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 13p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 251.

Descriptors: *Land areas, *Texas, Site selection, Avoidance, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project, Corridor avoidance, Land use.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 251/5GA PC$8.50/MF$1.45
Edaw Inc San Francisco Calif
LAND USE DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 107p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 252.

Descriptors: *Land areas, *Texas, Global communication systems, Extremely low frequency, Sites, Utilization, Inland waterways, Recreation, Agriculture, Transportation, Minerals, Rural areas, Urban areas, Planning.
Identifiers: *Sanguine project, *Land use.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 255/6GA PC$5.25/MF$1.45
Edaw Inc San Francisco Calif
TRANSPORTATION DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 41p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 256.

Descriptors: *Transportation, *Texas, Global communication systems, Extremely low frequency, Sites, Roads, Airports, Railroads, Bridges, Maps.
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles west-northwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 257/2GA PC$5.25/MF$1.45
Edaw Inc San Francisco Calif
LAND USE DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 44p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 258.

Descriptors: *Land areas, *Michigan, Global communication systems, Extremely low frequency, Sites, Utilization, Inland waterways, Forests, Agriculture, Transportation, Mines(Excavations), Rural areas, Urban areas, Planning.
Identifiers: *Sanguine project, *Land use.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 261/4GA PC$10.00/MF$1.45
Edaw Inc San Francisco Calif
SUBSURFACE WATER DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 136p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 262.

Descriptors: *Ground water, *Water supplies, *Michigan, Global communication systems, Extremely low frequency, Sites, Water wells, Quali-

ty, Chemical properties, Water table, Tables(Data).
Identifiers: *Sanguine project, Aquifers.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 263/0GA PC$4.50/MF$1.45
Edaw Inc San Francisco Calif
TRANSPORTATION DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 29p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 264.

Descriptors: *Transportation, *Michigan, Global communication systems, Extremely low frequency, Sites, Airports, Railroads, Roads, Harbors, Bridges, Maps.
Identifiers: *Sanguine project.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 278/8GA PC$4.00/MF$1.45
Edaw Inc San Francisco Calif
UTILITY SYSTEMS DATA OF THE LLANO TEXAS REGION: PROJECT SANGUINE.
Nov 73, 17p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 279.

Descriptors: *Public utilities, *Texas, Maps, Site selection, Radio transmitters, Global communication systems, Extremely low frequency, Electric power transmission, Transmission lines, Telephone lines, Pipelines.
Identifiers: *Sanguine project.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geogrpahical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 2400 square miles in area and is located about 60-80 miles westnorthwest of the city of Austin, Texas. The area includes all or portions of the following Texas counties: Llano, Mason, San Saba, McCullough, Gillespie, Blanco, and Burnet.

AD-780 286/1GA PC$4.00/MF$1.45
Edaw Inc San Francisco Calif
LAND OWNERSHIP DATA OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 16p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 287.

Descriptors: *Land areas, *Law, *Michigan, Global communication systems, Extremely low frequency, Sites, United States government, Industries, Recreation, Maps.
Identifiers: *Sanguine project, *Land ownership, Private land, Public land.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 289/5GA PC$9.25/MF$1.45
Edaw Inc San Francisco Calif
GOVERNMENTAL DATA OF THE WESTERN UPPER PENINSULA REGION, MICHIGAN: PROJECT SANGUINE.
Feb 74, 124p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 290.

Descriptors: *Land areas, *Law, *Boundaries, *Michigan, Global communication systems, Extremely low frequency, Sites, Regulations, Urban areas, Rural areas, Public utilities, Lakes, Rivers, Roads, Planning.
Identifiers: *Sanguine project, *Land use zoning, Local government, State government.

The purpose of this site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 292/9GA PC$4.00/MF$1.45
Edaw Inc San Francisco Calif
FIRST ORDER CORRIDOR AVOIDANCE AREAS OF THE UPPER MICHIGAN REGION: PROJECT SANGUINE.
Feb 74, 8p
Sponsored in part by Naval Facilities Engineering Command, Philadelphia, Pa. Northern Div. See also AD-780 293.

Descriptors: *Land areas, *Michigan, Site selection, Avoidance, Radio transmitters, Global communication systems, Extremely low frequency.
Identifiers: *Sanguine project, Corridor avoidance, Land use.

The purpose of the site study is to assist in determining the most appropriate location of the system within a specified geographical area considering both the optimum cost of system installation and the maximum environmental compatibility. The specific area studied is approximately 7300 square miles in area and encompasses most of the western portion of Michigan's Upper Peninsula. The area includes all or portions of the following Michigan counties: Alger, Baraga, Delta, Dickinson, Gogebic, Houghton, Iron, Marquette, Menominee, and Ontonagon.

AD-780 315/8GA PC$5.00/MF$1.45
Henry (J J) Co Inc Moorestown N J
AN ANALYSIS OF OIL OUTFLOWS DUE TO TANKER ACCIDENTS, 1971-1972.
Final rept.,
E. L. Jones. Nov 73, 169p* USCG-D-81-74
Contract DOT-CG-31445-A

Descriptors: *Oil spills, *Water pollution, *Accidents, *Tankers, Ships, Collisions, Statistical analysis, Tables(Data).
Identifiers: Oil pollution.

The report presents an analysis of the reported and estimated oil outflow resulting from tanker casualties. The data consists of 1587 world-wide tanker casualties occurring in 1971-1972, of which 376 incidents involved pollution. Only tanker vessels exceeding 100 GRT are considered. Trend comparisons are shown between this two year period and the 1969-1970 period. (Author)

AD-780 357/0GA Mag Tape $300.00
General Research Corp Arlington Va
COMPUTER SIMULATION OF HARD ROCK TUNNELING PROGRAM: PROGRAM TAPE.
Final technical rept. Oct 70-Apr 72,
R. R. Hibbard, and L. M. Pietrzak. May 73, 1 reel
Rept no. GRC-CR-2-190-Tape
Contract H0110238
Availability: Specify tape recording mode desired: 7 track, 556 and 800 BPI, odd and even parity, BCD; or 9 track, 800 BPI, odd parity, EBCDIC. Available to non-U.S. addresses $375.00. Price includes documentation - AD-763 563 thru AD-763 565 and AD-763 567.

Descriptors: *Construction, *Underground structures, *Computerized simulation, *Magnetic tape, Tunneling, Geological survey, Rock mechanics, Fragmentation, Earth handling equipment, Costs, FORTRAN.
Identifiers: FORTRAN 4 programming language, *Hard rock tunneling, Material control, Benefit cost analysis.

This is the magnetic tape containing computer programs listed in Volume 2 of the final technical report generated under contract H0110238. A computer model of the overall hard rock tunneling process which considers both performance and costs of the operation was developed. Segments of the tunneling process modeled include geology, fragmentation methods, muck removal, ground support, and environmental considerations. A three-dimensional stratified geology model, functions as a data file to represent geological conditions in the area surrounding the tunnel. The user has a choice of simulating rock fragmentation by drill and blast, boring machine, high velocity water jet, and projectile impact. He may also simulate either rail, truck, or conveyor belt haulage systems. Steel sets, shotcrete, and rock bolts are offered as a choice of ground support methods. Environmental factors considered include water removal, ventilation, and cooling. A cost accounting system is incorporated to provide cost-benefit analysis of tunneling system performance. (Author)

AD-780 424/8GA PC$4.50/MF$1.45
Tetra Tech Inc Pasadena Calif
A NUMERICAL MODEL FOR SIMULATION OF OIL SPREADING AND TRANSPORT AND ITS APPLICATION FOR PREDICTING OIL SLICK MOVEMENT IN BAYS.
Final rept. 12 Apr 72-28 Feb 74,
Shen Wang, and Li-San Hwang. Feb 74, 115p Rept no. TT-P-345-74-1
Contract N00014-72-C-0366
Sponsored in part by Coast Guard Research and Development Center, Groton, Conn.

Descriptors: *Oil spills, *Bays, Transport properties, Mathematical models, Motion, Computerized simulation, Predictions, Field tests, Wind, Ocean currents, Tides, Computer programs.
Identifiers: *Oil slicks, Long Beach Harbor, San Pedro Bay, SLICK computer program, Oil spreading processes.

A computer model for simulating oil spreading and transport has been developed. The model can be used as a useful tool in providing advance information and this may guide decisions for an effective response in control and clean-up once an accidental spill occurs. The spreading motion is simulated according to the physical properties of oil and its characteristics at the air-oil-water interfaces. The transport movement is handled by superimposing the spreading with a drift motion

caused by winds and tidal currents. By condisering an oil slick as a summation of many elementary patches and applying the principle of superposition, the model is capable of predicting the oil size, shape, and movement as function of time after a spill originates. Field experiments using either cardboard markers or soybeam oil to simulate a spill were conducted at the Long Beach Harbor. (Modified author abstract)

AD-780 435/4GA MF$1.45
Naval Oceanographic Office Washington D C
NEARSHORE CURRENTS AND CORAL REEF ECOLOGY OF THE WEST COAST OF GUAM, MARIANA ISLANDS.
Technical rept. 4 Feb-15 Sep 71,
Howard D. Huddell, J. Craig Willett, and Gregory Marchand. Jan 74, 202p Rept no. NOO-SP-259
Availability: Paper copy available from Naval Oceanographic Office, Washington, D. C. 20373. PC$5.00.

Descriptors: *Micronesia, *Ocean currents, *Coral reefs, *Marine biology, *Sewage disposal, *Water pollution, Sewage treatment, Wastes(Sanitary engineering), Tracer studies, Site selection.
Identifiers: *Guam, *Mariana Islands.

The Naval Oceanographic Office conducted two field investigations of the currents and coral reef ecology at Guam during winter and summer 1971. These investigations were made to assist in planning the locations of proposed sewer outfalls and to determine the level of sewage treatment required to prevent toxic levels of pollution on the beaches of Guam and ecological damage to the surrounding coral reefs. Currents were observed with current meters, parachute drogues, and dye injections. Permanent ecological monitoring stations were installed on the reef. At these stations, the sessile organisms were identified and charted, underwater photographs were taken and photomosaics constructed, and various individual organisms were photographed close-up for documentation. (Modified author abstract)

BNWL-SA-4881 PC$3.75/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
BUOYANT PLUME MODEL FOR PEDESTRIANS.
W. G. N. Slinn. Jan 74, 31p CONF-740302-2
Contract AT(45-1)-1830

Descriptors: (*Cooling towers, Plumes), (*Plumes, *Motion), Aerosols, Earth atmosphere, Heat transfer, Mathematical models, Meteorology, Water vapor, Wind.

For abstract, see NSA 29 12, number 29408.

BNWL-SA-4888 PC$3.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
ANALYTICAL SEARCH FOR THE STOCHASTIC-DOMINATING PROCESS IN THE DRIFT-DEPOSITION PROBLEM.
W. G. N. Slinn. Jan 74, 26p CONF-740302-3

Descriptors: (*Cooling towers, Plumes), (*Plumes, *Droplets), Aerosols, Air pollution, Deposition, Diffusion, Distribution, Earth atmosphere, Meteorology, Particle size, Stack disposal, Stochastic processes, Turbulence, Washout, Water vapor.

For abstract, see NSA 29 12, number 29409.

BNWL-SA-4919 PC$3.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
MEASURED CHROMIUM DISTRIBUTIONS RESULTING FROM COOLING TOWER DRIFT.
A. J. Alkezweeny, D. W. Glover, R. N. Lee, J. W. Sloot, and M. A. Wolf. 1973, 22p CONF-740302-1
Contract AT(45-1)-1830

Descriptors: (*Chromium, *Distribution), Absorption spectroscopy, Air, Cooling towers, Droplets, Plumes.

For abstract, see NSA 29 12, number 29418.

COM-74-11013-01/GA
(Order as COM-74-11013)
Georgia State Univ., Atlanta. Dept. of Biology.
MICROBIAL-FACILITATED DEGRADATION OF OIL: A PROSPECTUS,
D. G. Ahearn. 1973, 3p NOAA-74041708-1
Included in The Microbial Degradation of Oil Pollutants, p1-2, 1973. COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

The increasing dependency of industrialized nations on fossil hydrocarbons will not be appreciably altered in the near future. The current 'energy crisis,' with shortages of oil, will increase requirements for shipping and piping vast amounts of hydrocarbons. Thus, the likelihood of future catastrophic oil pollution will be heightened and chronic oil pollution will continue to be a problem. Practical applications for controlled biodegradation of oil may be developed for transformation of bilge wastes and spent lubricating oils to products not harmful to the environment. Following oil spills, various microbial treatments may be necessary to reduce toxicity and to remove residual oils after mechanical clean-up procedures have been instituted. Presently, defined microbial systems which give a proven increase of oil biodegradation in nature have not been developed. Moreover, neither the immediate or long-term effects of seeding hydrocarbonoclastic microorganisms into the environment have been established.

COM-74-11013-02/GA
(Order as COM-74-11013)
Scripps Institution of Oceanography, La Jolla, Calif.
MICROBIAL DEGRADATION OF OIL: PRESENT STATUS, PROBLEMS, AND PERSPECTIVES,
C. E. ZoBell. 1973, 15p NOAA-74041708-2
Included in The Microbial Degradation of Oil Pollutants, p3-16 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Virtually all kinds of hydrocarbons are susceptible to microbial degradation under favorable conditions. More than 200 species of bacteria, yeasts, and filmentous fungi have been shown to metabolize one or more kinds of hydrocarbons ranging from CH4 to compounds containing more than 40 carbon atoms. Although there is a wealth of information on the occurrence and kinds of oil-degrading microorganisms in oil-polluted environments, not much is known about their reaction rates or their intermediate degradation products. A summary is given on: the occurrence of hydrocarbon oxidizers in nature; kinds of hydrocarbon oxidizers; kinds of hydrocarbons oxidized; factors affecting the microbial degradation of oil; criteria for the microbial degradation of oil; biodegradation products; rate of oil degradation; the problem of oil in food chains; artificial seeding of oil spills; and the fate of oil in bottom deposits.

COM-74-11013-03/GA
(Order as COM-74-11013)
University Coll. of North Wales, Menai Bridge Marine Science Labs.
A THRENODY CONCERNING THE BIODEGRADATION OF OIL IN NATURAL WATERS,
G. D. Floodgate. 1973, 9p NOAA-74041708-3
Included in The Microbial Degradation of Oil Pollutants, p17-24 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

A plea for a more ecological approach to the problem of oil degradation--an insistence that when oil is spilled into water, the physics, chemistry and biology of the water must be taken into account. New ideas and new apparatus are required such as Gibbs has used in his semi-open system as a first approach to the problem, and its later developments. Other possible ways of measuring heterotrophic activity as yet unexplored in oil degradation, were suggested by Strickland. Also implied in the present paper is that research on this topic requires the cooperation of microbiologists, oil chemists and marine chemists. It is also a plea for recognition of our ignorance, and of the complexity of the problem. Broad generalizations, whether optimistic or pessimistic, are out of place. Our knowledge of what part microorganisms play in the ecology of estuaries, coastal waters and the deep oceans is at best sketchy.

COM-74-11013-04/GA
(Order as COM-74-11013)
Dayton Univ., Ohio. Dept. of Biology.
HYDROCARBON UTILIZATION BY 'CLADOSPORIUM RESINAE',
J. J. Cooney, and J. D. Walker. 1973, 9p NOAA-74041708-4
Prepared in cooperation with Maryland Univ., College Park. Dept. of Microbiology.
Included in The Microbial Degradation of Oil Pollutants, p25-32 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Cladosporum resinae resembles a number of hydrocarbon-using bacteria and yeasts in that it grows slowly on hydrocarbons. Moreover, limited growth is obtained on cyclic and aromatic compounds. However, the two strains examined do grow on a variety of substrates. Combinations of hydrocarbons and other nitrogen sources may enhance activity and are under examination. Moreover, somatic growth alone may not be an adequate criterion. C. resinae accumulates hydrocarbons, assimilating and oxidizing them by mechanisms that have been demonstrated for a number of bacteria and yeasts. Results summarized here may provide a beginning for evaluation of the role of C. resinae in aquatic and terrestrial environs, and for determining its potential as a seeding organism for oil slicks. Of equal importance with surface slicks, however, is the need to deal with accumulations of hydrocarbons in sediments.

COM-74-11013-05/GA
(Order as COM-74-11013)
Texas Univ., Austin. Dept. of Microbiology.
MICROBIAL DEGRADATION OF AROMATIC HYDROCARBONS,
D. T. Gibson, and W. K. Yeh. 1973, 7p NOAA-74041708-5
Included in The Microbial Degradation of Oil Pollutants, p33-38 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program.

Bacteria capable of growth on benzene, toluene, ethylbenzene, naphthalene and biphenyl were isolated from soil. Mutagenesis led to the isolation of different bacterial strains that will accumulate the initial products of hydrocarbon oxidation. The results obtained suggest that cis-hydroxylation is a common reaction in the microbial oxidation of aromatic hydrocarbons. Differences in mechanisms utilized by bacteria and mammals to oxidize aromatic hydrocarbons are illustrated. Mammals incorporate one atom of molecular oxygen into aromatic hydrocarbons with the formation of arene oxides. Subsequent enzymatic addition of water leads to the formation of transdihydrodiols. The

latter compounds can undergo NADP+-dependent oxidation to catechols. Bacteria utilize both atoms of molecular oxygen to form cis-dihydrodoils. The cyclic peroxide (dioxetane) intermediate is hypothetical. (Modified author abstract)

COM-74-11013-06/GA
(Order as COM-74-11013)
State Univ. Coll., Brockport, N.Y. Dept. of Biological Sciences.
MICROBIAL DEGRADATION OF OIL AND HYDROCARBONS IN CONTINUOUS CULTURE,
P. H. Pritchard, and T. J. Starr. 1973, 8p NOAA-74041708-6
Contract N00014-73-C-0074
Included in The Microbial Degradation of Oil Pollutants, p39-45 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Preliminary results are presented which support the proposed use of continuous culture techniques to study oil degradation. Experiments with both pure and mixed bacterial populations have shown that slow but significant degradation rates can be obtained with an undisturbed, two-phase (water-hydrocarbon) system. The study of the degradation of petroleum hydrocarbons in a continuous culture system presents a number of complicated problems, the most obvious of which is the water insolubility of the substrate. The purpose of this paper is to describe a continuous culture system, developed in our laboratory, which eliminates many of these problems and allows examination of oil degradation in an open versus a closed system. Using isolate J-10 in pure culture (obtained from batch culture enrichments on octane), degradation rates of 16.2 micro gram of octane consumed per hour were obtained. This rate was determined by following the decrease in percent transmittance of the Sudan III dye in the octane layer.

COM-74-11013-07/GA
(Order as COM-74-11013)
Texas Univ., Port Aransas. Marine Science Inst.
UTILIZATION OF CRUDE OIL HYDROCARBONS BY MIXED CULTURES OF MARINE BACTERIA,
H. Kator. 1973, 20p NOAA-74041708-7
Included in The Microbial Degradation of Oil Pollutants, p47-65 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Marine bacteria degraded hydrocarbons in crude oils in an enriched seawater medium. Normal and branched paraffins were preferentially utilized. Utilization rates were inversely related to chain length. Rapidly growing oil-degrading cultures consistently dispersed and metabolized thin layers of Louisiana, Kuwait and Venezuelan crude oils in ESW within 24 hours. In summary, n-paraffin degradation patterns were similar for different major crude oils. However, the rates of total n-paraffin utilization were significantly larger with the Louisiana crude oil. This oil contains roughly twice the amount of normal paraffins found in Kuwait and Venezuelan crude oils. It is evident that mixed populations of marine bacteria isolated on selected crude oils have a clear preference for normal and then branched paraffins. Inasmuch as hydrocarbon degradation in crude oils is sequential, further research utilizing steady-state conditions (without loss of oil) is required to evaluate the range and rates of hydrocarbons utilized or oxidized in crude oils.

COM-74-11013-08/GA
(Order as COM-74-11013)
University of Southern California, Los Angeles. Environmental Geology Program.
MICROBIAL DECOMPOSITION PATTERNS USING CRUDE OIL,
B. J. Mechalas, T. J. Meyers, and R. L. Kolpack. 1973, 14p NOAA-74041708-8
Contract NOAA-2-35227
Included in The Microbial Degradation of Oil Pollutants, p67-79- 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program.

A mixed culture of microorganisms, acclimated to decomposition of crude oil, was used in a series of incubation experiments to determine the sequence of microbial degradation in a Santa Barbara, California, crude oil. Microbial degradation of the crude oil is initially characterized by a rapid disappearance of the n-paraffin envelope. This degradation starts with the low molecular weight components and progresses toward the higher molecular weight compounds. The isoprenoids are also progressively reduced simultaneously with the reduction of the paraffins. In addition, the base envelope and fine fingerprint region subsequently undergo degradation and the base envelope becomes progressively skewed toward the higher molecular weight end of the chromatogram. Biodegradation of the Santa Barbara crude oil by a mixed microbial population was initiated simultaneously on all components, but the sequential patterns of decomposition were affected by rate differences. (Modified author abstract)

COM-74-11013-09/GA
(Order as COM-74-11013)
California Univ., Berkeley. Naval Biomedical Research Lab.
CONSIDERATIONS IN APPLICATION OF MICROORGANISMS TO THE ENVIRONMENT FOR DEGRADATION OF PETROLEUM PRODUCTS,
A. B. Cobet, H. E. Guard, and M. A. Chatigny. 1973, 8p NOAA-74041708-9
Contract N00014-69-A-0200-1001
Included in The Microbial Degradation of Oil Pollutants, p81-87 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Considerations in the use of microbial preparations for the degradation of oil pollutants are present. Besides obvious effects of nutrients on the environment, factors associated with emulsification of the oil pollutant, i.e., increased solubility and toxicity of the residue, and factors in application of the preparation (aerosolization) are discussed. The presence of potential human or animal pathogens in the microbial preparations used for seeding oil spills can create hazards either during the initial aerosolization or from the secondary aerosolization of spume of spray from the water surface. Biodegradation of an oil slick results in the formation of extracellular metabolic products, the effects of which should be considered. Aerobic biodegradation of the hydrocarbon molecule commences with the incorporation of molecular oxygen into the hydrocarbon. The resulting metabolic products may be more toxic and often have a greater solubility than the precursor compound.

COM-74-11013/1GA PC$7.50/MF$1.45
Louisiana State Univ., Baton Rouge. Center for Wetlands Resources.
THE MICROBIAL DEGRADATION OF OIL POLLUTANTS,
D. G. Ahearn, and S. P. Meyers. 1973, 347p* LSU-SG-73-01 NOAA-74041708
Contract N00014-73-C-0066, Grant NOAA-043-158-19
Proceedings of Workshop Held at Georgia State Univ., Atlanta, Ga. 4-6 Dec 72. Sponsored in part by Coast Guard, Washington, D.C., and Environmental Protection Agency, Washington, D.C.

Descriptors: *Oils, *Biodeterioration, *Meetings, Degradation, Bacteria, Ecology, Oceans, Marine biology, Water pollution, Microbiology, Hydrocarbons.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation, Oil spills.

Thirty-two papers constitute the proceedings of the workshop which was held to determine the present status of knowledge concerning the use of microorganisms in facilitating oil biodegradation, to assess future areas of investigation, to promote cooperative research projects, and to promote exchange of information. Papers are separately abstracted.

COM-74-11013-10/GA
(Order as COM-74-11013)
North Carolina State Univ., Raleigh. Dept. of Microbiology.
STUDIES ON THE DEGRADATION OF PETROLEUM BY FILAMENTOUS FUNGI,
J. J. Perry, and C. E. Cerniglia. 1973, 7p NOAA-74041708-10
Included in The Microbial Degradation of Oil Pollutants, p89-94 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, Microbial degradation.

Studies were initiated on the degradation of petroleum by microorganisms maintained in stock culture and originally selected for their ability to grow on hydrocarbon substrates. The results suggested that many of the constituent parts of complex petroleum could be utilized by these organisms but none could mineralize a significant part of the oil. It was evident, however, that the fungi available were superior to bacteria in the amount of growth attained on various crude oils. Tests with microbes isolated by enrichment with crude oil as substrate confirmed that fungi were more efficient in our system in mineralizing petroleum hydrocarbons. This report is concerned with several aspects of these hydrocarbon degradation studies. Our results suggest that filamentous fungi might have greater potential than bacteria in cleansing the environment of spilled petroleum. The fungi degrade greater quantities of oil during growth, in part perhaps due to their development as a mat on the surface of the oil.

COM-74-11013-11/GA
(Order as COM-74-11013)
Canada Centre for Inland Waters, Burlington (Ontario).
MICROBIAL DEGRADATION OF CRUDE OIL AND THE VARIOUS HYDROCARBON DERIVATIVES,
D. L. S. Liu. 1973, 11p NOAA-74041708-11
Included in The Microbial Degradation of Oil Pollutants, p95-104 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

The utilization of various petroleum products by a crude oil-grown bacterial culture has been studied using manometric and gas chromatographic techniques. A comparison of the gas chromatogram before and after growth showed that the n-alkane fraction had been preferentially utilized. Manometric techniques deomonstrated that the crude oil-grown cells could also rapidly degrade n-alkanes, hydrocarbon alcohols, methyl ester of fatty acids and alkybenzenes.

COM-74-11013-12/GA
(Order as COM-74-11013)
Georgia Univ., Athens. Dept. of Microbiology.
MICROBES AND PETROLEUM: PERSPECTIVES AND IMPLICATIONS,
W. R. Finnerty, R. S. Kennedy, P. Lockwood, B. O. Spurlock, and R. A. Young. 1973, 22p NOAA-74041708-12
Grants NSF-GB-8208, NSF-GB-34120

Prepared in cooperation with Georgia Inst. of Tech., Atlanta. Engineering Experiment Station.
Included in The Microbial Degradation of Oil Pollutants, p105-125 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, Microbial degradation.

An ultra-structure study of Acinetobacter grown on paraffinic and olefinic hydrocarbons demonstrated cytoplasmic sequestering of hydrocarbons. Induced membrane synthesis was additionally demonstrated as a result of hydrocarbon metabolism. Increased cellular and extracellular lipid synthesis was qualitatively and quantitatively documented during hydrocarbon metabolism. These studies serve to emphasize our lack of detailed knowledge concerning the consequences which may arise from this relationship. A serious problem facing hydrocarbon microbiology today is not so much microbial utilization of volatile petroleum fractions, but rather the biodegradation of resinous tars. These highly complex constituents of petroleum appear to be highly refractory to biological degradation so that further and immediate studies are needed to understand the apparent recalcitrant nature of these petroleum constituents. (Modified author abstract)

COM-74-11013-13/GA
(Order as COM-74-11013)
Biologische Anstalt Helgoland (West Germany).
DISTRIBUTION AND ABUNDANCE OF OIL-OXIDIZING BACTERIA IN THE NORTH SEA,
W. Gunkel. 1973, 13p NOAA-74041708-13
Included in The Microbial Degradation of Oil Pollutants, p127-139, 1973 COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, Microbial degradation.

Investigations include distribution of oil-oxidizing (and total heterotrophic bacteria) in the waters, surface films, sediments and beach sands of the North Sea in the vicinity of Helgoland and in the River Elbe estuary. Microbial concentrations in unpolluted samples, as great as 10,000,000,000 per liter of sediment, are reported. The results on the abundance of marine oil-oxidizing bacteria at the cable-buoy showed that all 57 samples contained oil-oxidizing bacteria. The average was 53,860 bacteria per liter with the percentage 0.52 to 16.8% of the total number of marine heterotrophic bacteria. Because it is highly unlikely that these large concentrations of bacteria belong to a single species, one can assume that bacteria with different potencies to break down various oil compounds are present throughout the year around Helgoland. The sediment samples collected around Helgoland give very different results. Bacterial numbers fluctuate about five orders of magnitude. The data indicate the presence of a large bacterial population which is able to decompose different types of hydrocarbons.

COM-74-11013-14/GA
(Order as COM-74-11013)
Naval Ordnance Test Station, China Lake, Calif. Michelson Labs.
MARINE HYDROCARBONOCLASTIC BACTERIA: TYPES AND RANGE OF OIL DEGRADATION,
G. Soli. 1973, 7p NOAA-74041708-14
Included in The Microbial Degradation of Oil Pollutants, p141-146 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, Microbial degradation.

Marine bacterial isolates were characterized on the basis of their ability to attack hydrocarbons in a complex synthetic mixture. It is possible to outline the oil degradation range of the organisms by properly balancing the various components. The degree of specialization and adaptation to hydrocarbon oxidation was determined indirectly with different nitrogen sources.

COM-74-11013-15/GA
(Order as COM-74-11013)
Rutgers - The State Univ., New Brunswick, N.J. Dept. of Biochemistry and Microbiology.
BIODEGRADATION OF OIL IN SEAWATER: LIMITING FACTORS AND ARTIFICIAL STIMULATION,
R. Bartha, and R. M. Atlas. 1973, 7p NOAA-74041708-15
Contract N00014-67-A-0115-0005
Included in The Microbial Degradation of Oil Pollutants, p147-152 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program.

The limiting factors of petroleum biodegradation in seawater were systematically evaluated. In the surveyed coastal waters, hydrocarbon oxidizers were found to be abundant, but their substrate ranges relatively restricted. Besides lowering the biodegradation rates, low water temperatures caused long lag periods due to retention of volatile inhibitors in crude oil. Nitrogen and phosphorus were found to be severely limiting. Addition of these nutrients dramatically increased oil biodegradation both in laboratory and in field experiments. An oleophilic fertilizer formula for use on floating oil slicks is described. Summarizing some identified or postulated causes that inhibit biodegradation of polluting oil in the sea, ZoBell listed the low numbers of marine hydrocarbon degraders, their limited substrate range, toxic substances in crude oil, lack of sufficient aeration, lack of adequate dispersion, suboptimal temperatures, and insufficiency of essential mineral nutrients such as nitrogen and phosphorus.

COM-74-11013-16/GA
(Order as COM-74-11013)
Scripps Institution of Oceanography, La Jolla, Calif.
BACTERIAL DEGRADATION OF MINERAL OILS AT LOW TEMPERATURES,
C. E. ZoBell. 1973, 10p NOAA-74041708-16
Included in The Microbial Degradation of Oil Pollutants, p153-161 1973, COM-74-11013-16.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Psychrophilic oil-oxidizing bacteria were demonstrated in 13 samples of oil-polluted water, soil, and tundra muck collected from the North Alaska Slope. Within a week or two there was visual evidence that clear mineral oil was being degraded by bacteria at 8 and 4C. Such activity became apparent after two to three weeks' incubation at -1.1C, the freezing point of the medium. From oxygen uptake data it was calculated that bacteria oxidized mineral oil at rates ranging from 0.13 to 0.9 mg/liter/day at -1.1C. Assuming an average generation time of 24 hours, it is calculated that a bacterial population of 1,000,000,000 reproducing cells per ml of mineral oil medium would consume oil for building biomass at a rate of 1.2 mg/liter/day at -1.1C. Nine different crude oils were found to be slowly attacked by bacteria growing at -1.1C.

COM-74-11013-17/GA
(Order as COM-74-11013)
Rhode Island Univ., Kingston. Dept. of Plant Pathology-Entomology.
BACTERIAL DEGRADATION OF PETROLEUM MATERIALS IN LOW TEMPERATURE MARINE ENVIRONMENTS,
R. W. Traxler. 1973, 9p NOAA-74041708-17
Included in The Microbial Degradation of Oil Pollutants, p163-170 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

It was found that sediments were a better source of organisms than water column samples. Not only were bacteria present in larger numbers in the sediments but a wider spectrum of genera were obtained from sediment samples. This seems particularly true for Chedabucto Bay which has a faster flushing rate than Narragansett Bay. To date, 49 hydrocarbon-utilizing bacteria were isolated from Chedabucto Bay and 72 organisms from Narragansett Bay. The capacity of all of these isolates to grow on hydrocarbons was confirmed by development on No. 1 Fuel Oil prior to screening studies. The Chedabucto Bay samples were obtained from a 16 to 17C environment, whereas the Narragansett Bay samples were taken at temperatures of 2.5 to 5C.

COM-74-11013-18/GA
(Order as COM-74-11013)
Alaska Univ., College. Inst. of Marine Science.
HYDROCARBON BIODEGRADATION IN ALASKAN WATERS,
B. Robertson, S. Arhelger, P. J. Kinney, and D. K. Button. 1973, 15p NOAA-74041708-18
Included in The Microbial Degradation of Oil Pollutants, p171-184 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Populations of hydrocarbon-oxidizing organisms were of the order of 1/cc in Alaska's Cook Inlet and Port Valdez, less in the Arctic Ocean. Distribution decreased with salinity in Cook Inlet and with depth in Port Valdez. In situ oxidation of 14-C-dodecane (91 microgram C/liter) stared within hours and proceeded at a rate of 1 microgram/liter-day. Storage of Cook Inlet crude oil for four years in sea water at 10C effected removal of most visible components. Mixing had a major effect on oil slick stability. The solubilization process was little affected by added silt, a major component of many Alaskan estuaries. Isolated organisms had unique preferences for various components of kerosene, emulsified crude oil and responded in a normal way to incubation temperature, E sub a 14.5 to 16 Kcal/mole. Some effects of crude oil inhibition are discussed. Calculations show that motility, particularly in combination with chemotaxis, is necessary for rapid slick inoculation.

COM-74-11013-19/GA
(Order as COM-74-11013)
Maryland Univ., College Park. Dept. of Microbiology.
MICROBIAL ECOLOGY AND THE PROBLEM OF PETROLEUM DEGRADATION IN CHESAPEAKE BAY,
R. R. Colwell, J. D. Walker, and J. D. Nelson, Jr. 1973, 14p NOAA-74041708-19
Contract N00014-69-A-0220-0006
Included in The Microbial Degradation of Oil Pollutants, p185-197 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Information obtained on the ecology of mercury-metabolizing bacteria in Chesapeake Bay has provided interesting comparisons with the petroleum-degrading microbial populations. Petroleum degradation studies are being done to obtain a seasonal incidence, as well as species distribution of petroleum-degrading microorganisms. It was found that the concentration of petroleum in an oil polluted site in Baltimore Harbor was five times greater than in Eastern Bay. The numbers of petroleum-degrading microorganisms, measured by direct and replica plating, in the water and sediment samples were related to the concentration of oil in each sample. Total yields of petroleum-degrading microorganisms grown on an oil substrate were greater for those organisms exposed to oil in the natural environment. Microorganisms isolated from water and sediment samples grew on

substrates representative of the aliphatic, aromatic and refractory hydrocarbons.

COM-74-11013-20/GA
(Order as COM-74-11013)
Florida State Univ., Tallahassee. Dept. of Oceanography.
ALKANE DEGRADATION IN BEACH SANDS,
T. E. Ahlfeld, and P. A. LaRock. 1973, 6p NOAA-74041708-20
Included in The Microbial Degradation of Oil Pollutants, p199-203 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

An estimation of the rate of n-alkane degradation was made in beach sands from Coal Oil Point, California. Bulk sand samples from a beach chronically polluted with oil from natural seeps were extracted and analyzed gas chromatographically and gravimetrically for hydrocarbon content. Calculations indicate that a maximum degradation of 0.32 g of n-alkanes occurs per day for 100 sq m of beach. The oil input on the day of sampling was estimated to be 5 g/100 sq m/day. From these figures it is seen that the daily maximum oxidation, including bacterial degradation, evaporation and autoxidation accounts for only 6% removal of the alkane content of the sand.

COM-74-11013-21/GA
(Order as COM-74-11013)
California Univ., Berkeley. Naval Biomedical Research Lab.
HYDROCARBONS OF SUSPECTED POLLUTANT ORIGIN IN AQUATIC ORGANISMS OF SAN FRANCISCO BAY: METHODS AND PRELIMINARY RESULTS,
L. H. DiSalvo, H. E. Guard, L. Hunter, and A. B. Cobet. 1973, 17p NOAA-74041708-21
Included in The Microbial Degradation of Oil Pollutants, p205-220 1973, COM-74-11013.

Descriptors: *Oils, *Aquatic animals.
Identifiers: *Water pollution effects(Animals), Sea Grant program.

Large amounts of petroleum-derived hydrocarbons enter the waters of San Francisco Bay each year, yet little is known concerning the fate and effects of pollutant hydrocarbons on estuarine organisms and, indirectly, on the human environment of the Bay area. Investigation into fate and effects of petroleum-derived hydrocarbons was initiated by analyzing the hydrocarbon content of selected Bay animals to determine if this served as an indicator of chronic hydrocarbon pollution in Bay food chains. Initial results have been obtained using solvent extracts of sponge, mussel, and crab tissues. Closely related animals were obtained from relatively clean waters along the northern California coast to provide 'unpolluted' control extracts for comparison. To date, it has been shown that Bay organisms have a significantly higher content of hydrocarbons than the clean water organisms.

COM-74-11013-22/GA
(Order as COM-74-11013)
Louisiana State Univ., Baton Rouge. Dept. of Food Science.
THE IMPACT OF OIL ON MARSHLAND MICROBIAL ECOSYSTEMS,
S. P. Meyers, D. G. Ahearn, S. Crow, and N. Berner. 1973, 9p NOAA-74041708-22
Grant EPA-R-800993
Prepared in cooperation with Georgia State Univ., Atlanta. Dept. of Biology, Contract N00014-77-C-0145.
Included in The Microbial Degradation of Oil Pollutants, p221-228 1973, COM-74-11013.

Descriptors: *Oils, *Aquatic microorganisms.
Identifiers: *Water pollution effects(Animals), Sea Grant program.

The vast productivity of wetland regions along the Louisiana coast, and their proximity to oil-producing sites, necessitates a more comprehensive understanding of the significance of alterations in the microbial community concurrent with oil intrusion and massive depositions of petroleum effluents. Investigations are concerned with examination of such effects on the microbial ecology and the basic food web of the Spartina marshland ecosystem.

COM-74-11013-23/GA
(Order as COM-74-11013)
Oklahoma State Univ., Stillwater. Dept. of Biochemistry.
PRODUCTION AND CHARACTERIZATION OF EMULSIFYING FACTORS FROM HYDROCARBONOCLASTIC YEAST AND BACTERIA,
P. E. Guire, J. D. Friede, and R. K. Gholson. 1973, 4p NOAA-74041708-23
Contract N00014-71-A-0004-0001
Prepared in cooperation with Midwest Research Inst., Kansas City, Mo., and Villanova Univ., Pa.
Included in The Microbial Degradation of Oil Pollutants, p229-231 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program.

The chemical conversion of oil pollutants to carbon dioxide (mineralization) and water-soluble, non-toxic organic oxidation products is an esthetically pleasing decontamination process which is being performed continuously by microorganisms in natural environments chronically polluted with oil. The authors are therefore interested in gaining an appreciably greater level of control over the location, rate, and perhaps end products of this biological wet combustion process. The authors have noted that a common characteristic of the growth of hydrocarbonoclastic microorganisms in liquid media containing hydrocarbons is the production of hydrocarbon-water emulsion early in the growth phase. Because of the potential value of biodegradable, non-toxic emulsifying factors for accelerating the growth and metabolic processes of microorganisms on oil pollutants, the authors have examined the production and some pertinent characteristics of emulsifying factors from a yeast (Candida petrophilum, ATCC 20226) and a bacterium (Pseudomonas aeruginosa, NCIB 9904) grown on hexadecane. (Modified author abstract)

COM-74-11013-24/GA
(Order as COM-74-11013)
Florida State Univ., Tallahassee. Dept. of Oceanography.
THE RELATIVE CHANGES IN N-ALKANE COMPOSITION IN SURFACE WATER SLICKS,
P. A. LaRock, and T. E. Ahlfeld. 1973, 5p NOAA-74041708-24
Included in The Microbial Degradation of Oil Pollutants, p233-236 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program.

Preliminary findings are reported here on the changes of n-alkane composition in surface slicks in Barataria Bay, Louisiana. At the locations studied, the net movement of water is to the south away from the gas wells in the north, and through Barataria Pass. By sampling away from the producing areas and toward the Pass, qualitative changes in the n-alkanes in surface slicks was followed. The general trend at stations 3, 4, and 6 shows alkanes with a chain length between C-17 and C-20 to be relatively unchanged, whereas C-14, C-16 and C-21 to C-32 show net decreases moving toward the south. This decrease amounted to 50 to 80% for alkanes over C-21. If dispersion were the principal factor in reducing the hydrocarbon density, little change in the alkane composition would be expected. Evaporation would affect the lower molecular weight material, and thus the changes in concentration of the long chain alkanes must presumably be the result of bacterial degradation.

COM-74-11013-25/GA
(Order as COM-74-11013)
Environmental Protection Agency, Gulf Breeze, Fla. Gulf Breeze Environmental Research Lab.
ESTUARINE MICROBES AND ORGANOCHLORINE PESTICIDES (A BRIEF REVIEW),
A. W. Bourquin. 1973, 8p Gulf Breeze Contrib-165 NOAA-74041708-25
Included in The Microbial Degradation of Oil Pollutants, p237-243 1973, COM-74-11013.

Descriptors: *Chlorohydrocarbons, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program.

Following a review of the literature, the author points out that pathways of microbial attack upon chlorinated hydrocarbons in the estuarine environment need to be investigated since breakdown by microorganisms is probably the main natural process of pesticide degradation. Although microbiological processes might reduce environmental pollution attributed to use of persistent pesticides, detailed studies of degradative pathways are required to assess the degree of hazard caused by breakdown products.

COM-74-11013-26/GA
(Order as COM-74-11013)
Georgia Univ., Athens. Dept. of Microbiology.
MEASUREMENT OF BASELINE LEVELS OF ENTERIC BACTERIAL ACTIVITY IN RIVER WATER,
C. W. Hendricks. 1973, 15p NOAA-74041708-26
Included in The Microbial Degradation of Oil Pollutants, p245-258 1973, COM-74-11013.

Descriptors: *Enterobacteriaceae, *Rivers.
Identifiers: *Oil pollution control, Sea Grant program.

The investigation indicates that natural populations and selected laboratory strains of enteric bacteria, including pathogens, have the capacity to metabolize substrates present in the Oconee River, including autoclaved river water. These organisms, however, lacked the ability to increase in numbers in continuous culture with river water and suspended detritus recovered above a secondary sewage treatment facility, but demonstrated positive growth rates with substrates recovered below the plant. Data also showed that the sands and clays forming the stream bottom had the capacity to sorb substrates from the overlayering water, and that sediment eluates stimulated the respiration rate of bacteria. This suggests that the stream bottom can provide a suitable environment for the growth of bacteria and perhaps controls basal nutrient concentration in the water itself.

COM-74-11013-27/GA
(Order as COM-74-11013)
Oregon State Univ., Corvallis. Dept. of Zoology.
SUBLETHAL EFFECTS OF THE WATER SOLUBLE COMPONENT OF OIL: CHEMICAL COMMUNICATION IN THE MARINE ENVIRONMENT,
F. T. Takahashi, and J. S. Kittredge. 1973, 7p NOAA-74041708-27
Contract NOAA-2-35187, N00014-71-C-0103
Prepared in cooperation with City of Hope National Medical Center, Duarte, Calif. Div. of Neurosciences. Sponsored in part by Grant NSF-GB-27703.
Included in The Microbial Degradation of Oil Pollutants, p259-264 1973, COM-74-11013.

Descriptors: *Oils, *Aquatic animals.
Identifiers: *Water pollution effects(Animals).

Crude oil and petroleum products contain water soluble components that are potent inhibitors of

chemoreceptors in marine organisms. Since many species rely on chemoreception for location of food and sexual partners, disruption of chemoreception in the marine environment by oil spills can have profound effects on survival and reproduction. These effects on species survival will not be revealed in the usual toxicity (LD) studies of pollutants.

COM-74-11013-28/GA
(Order as COM-74-11013)
Texas Wesleyan Coll., Fort Worth. Div. of Science.
SOME ACUTE EFFECTS OF LOW-BOILING PETROLEUM FRACTIONS ON THE CELLULAR STRUCTURES OF FISH GILLS UNDER FIELD CONDITIONS,
W. G. Blanton, and M. C. Robinson. 1973, 10p
NOAA-74041708-28
Contract EPA-68-01-0051
Prepared in cooperation with Tarrant County Junior Coll., Fort Worth, Tex.
Included in The Microbial Degradation of Oil Pollutants, p265-273 1973, COM-74-11013.

Descriptors: *Oils, *Fishes.
Identifiers: *Water pollution effects(Animals), Sea Grant program.

Fish taken from the area of the oil slick showed gill damage in the form of cell loss. The alterations of branchial filaments may produce certain physiological malfunctions. The loss of sufficient acidophiles would reduce the production of carbonic anhydrase-like enzyme. This enzyme deficiency could lead to pH changes in the blood and tissue fluids (acidosis or alkalosis) through a reduction in the rate of dissociation of carbonic acid into CO2 and hence malfunction of the blood-buffer system. Loss of mucous cells may result in the clogging of the filaments with detritus. Resultant irritation of the filament may produce epithelial sloughing as that seen in test specimens. These data are not conclusive with regard to the impact of petroleum fractions on pelagic megafauna because of the migratory nature of these animals; however, the observed damage raises certain critical questions which deserve further investigations under controlled laboratory conditions.

COM-74-11013-29/GA
(Order as COM-74-11013)
Harvard Univ., Cambridge, Mass. Lab. of Applied Microbiology.
INHIBITION OF BACTERIAL CHEMORECEPTION BY HYDROCARBONS,
F. Walsh, and R. Mitchell. 1973, 5p NOAA-74041708-29
Contract N00014-67-A-0298-0026
Included in The Microbial Degradation of Oil Pollutants, p275-278 1973, COM-74-11013.

Descriptors: *Oils, *Aquatic microorganisms.
Identifiers: *Water pollution effects(Animals), Sea Grant program.

A wide variety of chemical and physical water pollutants is shown to inhibit microbial chemotaxis. Such chemotaxis inhibition may have direct effects on microbial predator-prey relationships or on the rate of degradation of organic substrates in the sea. The effect of a broad spectrum of hydrocarbons on bacterial chemotaxis is described. Those hydrocarbons which affect chemotaxis at concentrations found in the environment may be ecologically significant in that they may alter predator-prey interactions or the rate of biodegradation of organic substrates without affecting gross bacterial physiology. One marine bacterium, studied in detail, showed a wide variation in chemotactic response in the presence of the hydrocarbons. The effect of pollutants on chemotaxis has important short- and long-term implications. In the vicinity of a pollutant release, the latter can seriously affect the microbial community. (Modified author abstract)

COM-74-11013-30/GA
(Order as COM-74-11013)
Georgia State Univ., Atlanta. Dept. of Biology.
DEGRADATION OF CRUDE OIL BY YEASTS AND ITS EFFECTS ON 'LESBISTES RETICULATUS',
W. L. Cook, J. K. Massey, and D. G. Ahearn.
1973, 5p NOAA-74041708-30
Contract N00014-77-C-0145
Included in The Microbial Degradation of Oil Pollutants, p279-282 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration, *Yeasts.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Two hydrocarbonoclastic yeasts, Candida tropicalis and Endomycopsis lipolytica selected for the study of hydrocarbon-utilization activities, have been examined in combination with crude oils for their effects on the mortality of the common guppy, Lesbistes reticulatus. Water samples from tanks with yeast and crude oil were examined microscopically. In nearly every field examined, numerous amoebae, flagellates, ciliates, Daphnia and other micro-invertebrates were observed feeding on the yeasts as well as ingesting small oil globules. In aquaria with oil, but lacking yeasts, approximately one microscopic field in 50 contained invertebrates. The concentration of invertebrate predators in the natural environment in areas enriched with yeasts has been noted. The closed system laboratory experiments suggest that metabolites or by-products produced during yeast decomposition and emulsification of certain high asphalt crudes may be harmful to fish.

COM-74-11013-31/GA
(Order as COM-74-11013)
Rutgers - The State Univ., New Brunswick, N.J. Dept. of Biochemistry and Microbiology.
EFFECTS OF SOME COMMERCIAL OIL HERDERS, DISPERSANTS AND BACTERIAL INOCULA ON BIODEGRADATION OF OIL IN SEAWATER,
R. M. Atlas, and R. Bartha. 1973, 8p NOAA-74041708-31
Contract N00014-67-A-0115-0005
Included in The Microbial Degradation of Oil Pollutants, p283-289 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

The effects on petroleum biodegradation of several oil herders, dispersants and commercial bacterial inocula were tested. The oil herders and dispersants significantly increased the rate of mineralization but not the extent of petroleum biodegradation. The beneficial effect is apparently due to the increased surface of oil droplets and an absence of toxicity to oil degrading microorganisms at the recommended concentrations. The two commercial bacterial inocula tested failed to improve either the rate or the extent of oil biodegradation when tested in natural seawater. In sterile seawater, these inocula showed inferior performance compared to the natural microflora of seawater, and were judged to be ineffective for marine applications. Data on the safety and effectiveness of available oil pollution control products are basic to their correct use. While numerous studies have been conducted on the toxicity of such products to vertebrates and invertebrates, little is known about their effects on the indigenous microflora of the sea. (Modified author abstract)

COM-74-11013-32/GA
(Order as COM-74-11013)
Texas Univ., Port Aransas. Marine Science Inst.
BACTERIAL SEEDING TO ENHANCE BIODEGRADATION OF OIL SLICKS,
R. Miget. 1973, 20p NOAA-74041708-32
Included in The Microbial Degradation of Oil Pollutants, p291-309 1973, COM-74-11013.

Descriptors: *Oils, *Biodeterioration.
Identifiers: *Oil pollution control, Sea Grant program, *Microbial degradation.

Evaluations have been made to determine the feasibility of adding selected hydrocarbon-oxidizing bacteria and required nutrient salts to an oil slick to enhance biodegradation of the polluting hydrocarbon. Fifty active mixed cultures were isolated. Culture characteristics including cell morphology, temperature tolerance, and resistance to chemical dispersants were determined. Biodegradation of adsorbed vs. non-adsorbed oil was compared, and media for mass cultivation of organisms was developed. Simulated field, or tank, experiments showed the effectiveness of microbial seeding varied more with the type and quantity of crude oil used than with such factors as inoculum density or nutrient salt concentration. Initial 24-hr oil losses were generally twice as large in bacterial seeded tanks relative to uninoculated controls. Biological Oxygen Demand and Total Organic Carbon analyses of tank water indicated little metabolic product pollution of the water.

COM-74-11031/3GA PC$5.50/MF$1.45
Texas A and M Univ., College Station.
A SURVEY OF THE ECONOMIC AND ENVIRONMENTAL ASPECTS OF AN ONSHORE DEEPWATER PORT AT GALVESTON, TEXAS. PART II. ENVIRONMENTAL CONSIDERATIONS,
Roy W. Hann, Jr., and Wesley P. James. Apr 74, 42p TAMU-SG-74-214 NOAA-74050702
Grant NOAA-043-158-18
Report on Sea Grant Program. See also Part 1, COM-74-11030.

Descriptors: *Seaports, *Environmental surveys, *Fuel oil, *Marine transportation, Surveys, Petroleum industry, Water pollution, Spoils, Dredging, Water quality, Economics, Texas.
Identifiers: Oil pollution, Galveston(Texas), Offshore terminals, *Deepwater terminals, *Onshore deepwater ports, Offshore terminals.

The report outlines environmental aspects associated with the proposed deep draft channel from a terminus near Pelican Island to the 100 foot depth contour some 57 miles offshore in the Gulf of Mexico. The report presents some of the major environmental factors which would be affected by the project and outlines ways that the impact on the environmental components could and should be evaluated. Such environmental modifications can have both environmental costs in the form of environmental degradation or environmental benefits in the form of environmental enhancement. The project also has the potential for environmental pollution from accidental oil spills, dredge spoil disposal and other project activities, which must be considered as environmental degradation and cost.

COM-74-11125/3GA PC$9.00/MF$1.45
Massachusetts Inst. of Tech., Cambridge. Sea Grant Project Office.
PRIMARY, PHYSICAL IMPACTS OF OFFSHORE PETROLEUM DEVELOPMENTS.
Apr 74, 449p MITSG-74-20 NOAA-74050602
Report to Council on Environmental Quality. Index No. 74-820-Nwm.

Descriptors: *Continental shelves, *Oil recovery, *Water pollution, *Offshore drilling, Coasts, Tanker ships, Shipping, Environmental surveys, Accidents, Atlantic Ocean, Petroleum transportation, Alaska Gulf.
Identifiers: Sea Grant program, Oil spills, *Oil pollution.

These studies on the initial physical effects of offshore oil development respond to the need for information on potential petroleum production from the Atlantic and Gulf of Alaskan continental shelves. In the first section of this report, a range of hypothetical oil finds is analyzed for the number of platforms and the levels and types of petroleum transport that would be needed. Related

to these production activities, the probability of oil spills and spill volume has been determined. Following this, researchers have hypothesized the expected oil spill trajectories for the Atlantic coast and the Gulf of Alaska. The final section explores the weathering of oil spills in examining the evaporation and diffusion of the lighter components from the slick.

COM-74-11140/2GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
METAL WASTE RECLAMATION. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-May 74,
Mona Smith. Jul 74, 151p* NTIS-WIN-74-053

Descriptors: *Solid waste disposal, *Metal scrap, *Materials recovery, Containers, Reclamation, Cans, Metal industry, Automobiles, Refining, Economic analysis, Cost estimates, Steels, Nickel, Zinc, Copper, Aluminum, Separation, Industrial waste treatment.
Identifiers: Scrap metal industry, *Waste recycling, Junk car disposal, Metal recycling.

This bibliography contains 146 selected abstracts of research reports retrieved using the NTIS online search system - NTISearch. The cited reports cover the following topics: Metal scrap refining, metal waste separation techniques, the secondary metal industry, economic factors in metal recovery, junk car disposal, and other related subjects.

CONF-740406-1 PC$4.25/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
STUDY OF OPTIONS FOR CONTROL OF EMISSIONS FROM AN EXISTING COAL-FIRED ELECTRIC POWER STATION.
R. Salmon, and J. P. Nichols. 1974, 25p

Descriptors: (*Sulfur oxides, *Air pollution), (*Coal, Air pollution), (*Synthetic fuels, Air pollution), Control, Cost, Efficiency, Electric power, Energy shortages, Filters, Fossil-fuel power plants, Gaseous wastes, Oils, Petroleum, Reliability, Stack disposal, Transport.

For abstract, see NSA 29 12, number 31455.

JPRS-61968 PC$3.75/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NUMBER 30.
13 May 74, 57p
Trans. from various jnls.

Descriptors: *Pollution, *Air pollution, *Water pollution, *Noise pollution, Ecology, Translations, Yugoslavia, Peru, Lebanon, USSR.

Contents: Yugoslavia - Environmental protection in Montenegro urged; Peru - Antipollution mining measures praised; Lebanon - Once beautiful coast now disfigured by unrestricted dumping; USSR - Industrial noise suppression standards explained; noise level studies in civil aviation described; problems of reducing noise in industry; combating noise, vibration at steel plants; noise suppression in housing construction discussed; construction of treatment facilities at Solikamsk paper complex delayed; Moscow suburb experiments with reclaimed water; book reviewed on problems of biosphere.

JPRS-62002 PC$3.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NUMBER 31.
15 May 74, 36p
Trans. from various jnls.

Descriptors: *Pollution, *Air pollution, *Water pollution, *Noise pollution, Ecology, Translations, East Germany, Poland, USSR, West Germany.

Contents: East Germany - Schwedt refinery water purification process described; Poland - Chemical industry helps environmental protection; water chemical control; USSR - USSR-American cooperation against sea pollution; edict on sea pollution issued; noise control, air pollution, nature conservation in Belorussia; round table discussion of Moscow oblast water quality; conference on ventilation and air conditioning; international endangered species book described; Black Sea pollution study; West Germany - Pollution causes increasing drinking water problems in the FRG.

JPRS-62022 PC$3.25/MF$1.45
Joint Publications Research Service, Arlington, Va.
TRANSLATIONS ON ENVIRONMENTAL QUALITY. NUMBER 32.
17 May 74, 47p
Trans. from various jnls.

Descriptors: *Pollution, *Air pollution, *Water pollution, Industrial wastes, Radioactive waste treatment, Solid waste disposal, Ecology, Translations, Yugoslavia, Tunisia, Chile, USSR.

Contents: Yugoslavia - Pollution of Danube termed worsening; Chile - National conservation awareness will be taught in course; Tunisia - Varied approaches to pollution in Lake of Tunis; USSR - Call for international action against ocean pollution; preservation of water resources in republics; Ponomarev discusses Urals environmental protection; signing of Baltic antipollution convention hailed; minister reports on Baltic pollution convention; atomic energy official on disposal of radioactive waste; hunting farm mismanagement in Azerbaydzhan reported; chemicals endanger larks in Vologodskaya Oblast; news briefs.

K-1859 PC$5.45/MF$1.45
Oak Ridge Gaseous Diffusion Plant, Tenn. (Usa).
ENVIRONMENTAL ASPECTS OF COOLING TOWER OPERATION: SURVEY OF THE EMISSION, TRANSPORT, AND DEPOSITION OF DRIFT FROM THE K-31 AND K-33 COOLING TOWERS AT ORGDP.
P. A. Jallouk, G. J. Jr. Kidd, and T. Shapiro. Feb 74, 74p
Contract W-7405-eng-26

Descriptors: (*Gaseous diffusion plants, Cooling towers), (*Cooling towers, *Aerosol wastes), (*Nonradioactive wastes, Aerosol wastes), Aerosols, Air pollution, Deposition, Diffusion, Earth atmosphere, Environment, Gaseous wastes, Industrial plants, Particles, Plants, Pollution.

For abstract, see NSA 29 12, number 29420.

ORNL-NSF-EATC-4 PC$11.75/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
SURVEY OF MERCURY USAGE BY AGENCIES OF THE UNITED STATES GOVERNMENT DURING 1971.
W. E. Clark. Mar 74, 171p

Descriptors: (*Mercury, *Uses), (*Environment, *Pollution), Health hazards, Usa.

For abstract, see NSA 29 12, number 31634.

ORNL-TM-4498 PC$7.50/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
ENVIRONMENTAL IMPACTS ASSOCIATED WITH ELECTRIC TRANSMISSION LINES.
J. T. Kitchings, H. H. Shugart, and J. D. Story.
Mar 74, 109p
Contract W-7405-eng-26

Descriptors: (*Electric power, Power transmission), (*Power transmission, *Environment), Birds, Ecosystems, Equipment, Herbicides, Insecticides, Plants, Soils, Wild animals.

For abstract, see NSA 29 12, number 29403.

PB-231 300-02/GA PC$25.00/MF$25.00
Environmental Protection Agency, Washington, D.C. Grants Administration Div.
WASTEWATER TREATMENT CONSTRUCTION GRANTS DATA BASE; PUBLIC LAW 92-500 PROJECT RECORDS.
Rept. for May 74.
Jun 74, 108p* EPA-GAD-220-2-74-003

Descriptors: *Sewage treatment, *Industrial waste treatment, *Grants, *Water pollution control, Construction, Industrial plants.
Identifiers: Sewage treatment plants.

Awards for wastewater treatment facilities under Public Law 92-500 are listed for May 1974. The publication provides the essential information on all awards made during the month listed. The awards are sorted by state and the information provided is applicant identification, grant number, grant title, award date, award amount, grant step such as one- planning, two-design, three- construction, description of facility to be constructed and other data.

PB-232 440/8GA PC$4.75/MF$1.45
Michigan Univ., Ann Arobr. Great Lakes Resource Management Program.
SAGINAW BAY: AN EVALUATION OF EXISTING AND HISTORICAL CONDITIONS.
Final rept.,
Paul L. Freedman. Apr 74, 141p EPA-905/9-74-003
Contract EPA-68-01-1577

Descriptors: *Water pollution, *Saginaw Bay, Lake Huron, Geomorphology, History, Contaminants, Physical properties, Primary biological productivity, Dissolved gases, Biochemical oxygen demand, Oxygen, Alkalinity, Calcium chlorides, Trace elements, Metals, Phosphorus organic compounds, Nitrogen organic compounds, Sodium organic compounds, Sulfates, Silicon organic compounds, Bacteria, Plankton, Fishes.
Identifiers: *Water quality data.

The water quality in Saginaw Bay has deteriorated from its natural Lake Huron character through man's overburdening use. Both the physical-chemical and biological characteristics indicate deteriorating conditions and trends. The intent of this report has been to compile and evaluate existing information on Saginaw Bay and document its present status. Water quality and trophic status have been evaluated with regard to physical, chemical, and biological parameters. Efforts were made to identify the community structure of aquatic plant and animal populations. Further emphasis has been placed on the identification and nature of water-quality variations and trends and the impact of contaminant sources on the system.

PB-232 445/7GA PC$5.75/MF$1.45
Battelle-Pacific Northwest Labs., Richland, Wash. Atmospheric Sciences Dept.
NATURAL PRECIPITATION WASHOUT OF SULFUR COMPOUNDS FROM PLUMES.
Final rept.,
M. Terry Dana, J. M. Hales, W. G. N. Slinn, and M. A. Wolf. Jun 73, 215p* EPA-R3-73-047

Descriptors: *Air pollution, *Sulfur dioxide, *Electric power plants, Plumes, Sulfates, Rain, Acidity, Models, Computer programs, FORTRAN.
Identifiers: *Precipitation washout.

This report describes field measurement and modeling of the washout of SO2 and sulfate from plumes. Field measurements of precipitation washout were conducted in conjunction with both

controlled test sources and actual power plant plumes. A primary achievement of this work has been the formulation of an SO2 washout model, which predicts rain-borne SO2 concentrations that agree favorably with those observed. An approximate theoretical analysis of sulfate washout in conjunction with field observations indicates that sulfate formation and scavenging exhibit a strong inverse dependence on acidity levels in the background rain. (Modified author abstract)

PB-232 528/0GA PC$5.50/MF$1.45
Federal Highway Administration, Washington, D.C. Socio-Economic Studies Div.
SOCIAL AND ECONOMIC EFFECTS OF HIGHWAYS.
Final rept.
May 74, 185p*

Descriptors: *Highways, *Land use zoning, *Communities, Regional planning, Relocation, Access roads, Land titles, Urban areas, Commerce, Distance, Visibility, Position(Location), Environments, Availability, Economic development.
Identifiers: *Highway neighborhood impact, Business location, Sociological factors.

The report summarizes social and economic effects of modern highways and shows some of the problems of determining these effects, as well as the progress of social highway impact studies made in recent years by State highway agencies and the Federal Highway Administration, along with abstracts of 76 studies completed in the last five years and brief descriptions of 41 additional studies now underway.

PB-232 546/2GA PC$4.50/MF$1.45
Federal Highway Administration, Washington, D.C.
HIGHWAY FOCUS TOWARD AN UNDERSTANDING OF EARTHQUAKES.
Final rept.,
Walter Podolny, Jr., and James D. Cooper. Mar 74, 114p*

Descriptors: *Highway bridges, *Earthquake resistant structures, Bridges(Structures), Bridge piers, Superstructures, Bridge foundations, Bridge abutments, Bridge anchorages, Bridge decks, Seismic waves, Dynamic structural analysis, Earthquakes.
Identifiers: Earthquake engineering.

The treatise was prepared to present basic information such that those engineers unfamiliar with the earthquake phenomena will acquire a better understanding of the causes and distribution of earthquakes. Efforts being undertaken to mitigate the effects of earthquakes on bridges are discussed.

PB-232 557/9GA PC$3.75/MF$1.45
New York State Dept. of Transportation, Albany. Engineering Research and Development Bureau.
TRANSVERSE JOINT CONSTRUCTION AND SEALING PRACTICES: 1968-72.
Interim rept. 1968-72,
Robert D. Carlson. Mar 74, 53p* NYSDOT-ERD-74-RR-20
See also PB-227 746.

Descriptors: *Concrete pavements, *Joint sealers, Performance evaluation, Chloroprene resins, Highways, New York.

Since March, 1968, transverse contraction joints in New York State have been constructed 5/8-in. wide with beveled edges, and sealed with 1-1/4-in. wide preformed polychloroprene compression sealers. This study was initiated to evaluate this new system, and to investigate three laboratory tests that may more accurately predict field performance of sealers. This interim report evaluates joint construction and sealing methods, as well as field performance for the first three to four years. Quarterly evaluation surveys have been conducted to determine long-term performance. After service of up to four years, the joints are performing satisfactorily and no sealers have failed. Some fines have begun to collect between the sides of the sealer and the joint faces, but none have worked their way to the bottom of joint grooves. (Modified author abstract)

PB-232 581/9GA PC$7.50/MF$1.45
Louisiana Advisory Commission on Coastal and Marine Resources, Baton Rouge.
LOUISIANA WETLANDS PROSPECTUS. CONCLUSIONS, RECOMMENDATIONS AND PROPOSALS OF THE LOUISIANA ADVISORY COMMISSION ON COASTAL AND MARINE RESOURCES.
Final rept.,
Marc J. Hershman. Sep 73, 346p* LACCMR-FL-73-03

Descriptors: *Coastal zone management, *Natural resources, *Louisiana, Estuaries, Wildlife, Birds, Fishes, Shellfish, Recreation, Flood control, Mineral deposits, Crude oil, Natural gas, Marine terminals, Water quality management, Agriculture, Maritime industry, Law enforcement, Education, Swamps, Economic development, Inventories.
Identifiers: Deepwater ports.

The report contains specific recommendations for planning and managing, development, and conservation in the coastal zone; an inventory of the state's coastal resources; a study of trends in the use of the wetlands; and a series on the effects of recreation, offshore industries, research and education, and technology on the Louisiana Wetlands. Also included in the report are a proposed legal and administrative scheme for managing the coastal zone and a proposed Coastal Zone Management statute establishing a permit system for regulating significant uses.

PB-232 607/2GA PC$6.75/MF$1.45
Integrated Systems, Inc., Chevy Chase, Md.
PREDICTION OF LONG-TERM STRESS RANGES. STUDY REPORT.
Final rept.,
J. W. Fothergill, H. Y. Lee, and P. A. Fothergill. Jun 73, 290p* FHWA-RD-73-42
Contract DOT-FH-11-7904

Descriptors: *Highway bridges, *Stresses, *Dynamics loads, Bending stress, Vehicular traffic, Computerized simulation, Fatigue(Materials), Modulus of elasticity, Steel, Reinforced concrete, Stiffness, Bridge decks, Structural analysis, Computer programming, FORTRAN.
Identifiers: BRIGLD 1 computer program, BRGSTRS computer program.

The development of a computer simulation program system for generating highway traffic crossing a bridge and calculating the resulting stresses and stress ranges is described. The total system consists of four stand-along programs which can be used either independently or as a dependent series where output from one program is used as input to the next. Output consists of loading and stress range histograms. A summary of all work performed and a description of each of the developed computer programs is presented. Included is a discussion on methods employed in the development including the stress calculations, the traffic generator, and preparation of stress histograms, results of a sensitivity or parameter study, and deficiencies in the methods of analysis. Comparisons of predicted and experimentally measured results are given.

PB-232 616/3GA PC$3.25/MF$1.45
Toledo Regional Area Plan for Action, Ohio.
GOALS AND POLICIES PROPOSAL: SUMMARY.
Final rept.
Mar 74, 43p TCPC-GPPS-74-0011

Descriptors: *Urban planning, *Ohio, History, Land use zoning, Policies, Objectives, Residential buildings, Industrial buildings, Commercial buildings, Urban transportation.
Identifiers: *Toledo(Ohio).

The report presents goal and policy guidelines for the Toledo Master Plan updating process. There are three areas of analysis; historical, current national trends and citizen attitudes toward land use issues. Goals and policies are organized in five categories or systems: man-made physical, social, natural, economic and political. A companion report, 'Goals and Policies: The Foundation Analysis,' supplements the policy generation process addressed in the first sections of this report. The proposal assumes a continuous comprehensive planning process rather than a map/product and target date oriented study. Logically, some priority statements are generated in this report, to be used in integrating critical short range concerns with overall policy directions for the City of Toledo.

PB-232 627/0GA PC$5.00/MF$1.45
Toledo Regional Area Plan for Action, Ohio.
GOALS AND POLICIES PROPOSAL. THE FOUNDATION ANALYSIS.
Final rept.
Mar 74, 170p TCPC-GPPS-74-0010

Descriptors: *Urban planning, *Ohio, Land use zoning, Recreation, Subdivision regulations, Policies, Residential buildings, Commercial buildings, Industrial buildings, Urban transportation.
Identifiers: *Tqledo(Ohio).

The report presents the data, analysis and concept inputs relevant to Phase I of the Toledo Master Plan update: goals and policies for Toledo. In Part I, an analysis of past efforts in goal formulation is offered, followed by a procedure for the update in total. Part II presents the results of a citizen attitude survey aimed at clarifying popular opinion towards various land use/development policies. Finally, Part III offers an overview and rationale for policy generation in Toledo.

PB-232 650/2GA PC$3.25/MF$1.45
Tennessee State Planning Office, Nashville. Middle Tennessee Section.
COMMUNITY FACILITIES PLAN, WHITE HOUSE, TENNESSEE.
Apr 74, 50p TN-WHIH-74-1017

Descriptors: *Urban planning, *Community facilities, *Tennessee, Population growth, Recreation facilities, Public utilities, Schools, Libraries.
Identifiers: *White House(Tennessee).

The study lists and analyzes all major services and facilities provided by the City of White House, TN. Recommended standards and service levels are discussed. Existing facilities are measured against the standard, a plan based thereon, and on projected population developed.

PB-232 661/9GA PC$14.75/MF$1.45
Texas Univ., Austin.
ESTABLISHMENT OF OPERATIONAL GUIDELINES FOR TEXAS COASTAL ZONE MANAGEMENT: INTERIM REPORT ON ECONOMICS AND LAND USE.
Kingsley E. Haynes, and Jared E. Hazleton. May 73, 232p NSF-RA/E-73-020
Grant NSF-GI-34870

Descriptors: *Coastal zone management, *Land use, *Management planning, *Texas, Assessments, Government policies, Land development, Environmental surveys, Economic analysis, Mathematical models, Regional planning, Economic development, Demography.
Identifiers: Economic impacts, *Environment impacts.

The overall goal fo this project is to develop and test a methodology for assessing the economic and environmental impact of alternative public policies for management of coastal zone environmental resources of the Texas Coastal Bend COG Region. The objectives of this task force in fulfilling that goal were: (1) Development and evaluation of input/output and demographic models to project under varying assumptions the level of economic activity by industrial sector and the expected level and composition of population in the Coastal Bend Region; and (2) the development and assessment of a land use model to spatially allocate households and industry within the study region. The results to date of the steps necessary to accomplish these objectives are presented.

PB-232 682/5GA PC$17.50/MF$1.45
Southwest Research Inst., San Antonio, Tex.
A SURVEILLANCE STUDY OF SMOKE FROM HEAVY-DUTY DIESEL-POWERED VEHICLES - SOUTHWESTERN U.S.A.
Final rept.,
John O. Storment, and Karl I. Springer. Jan 74, 290p SwRI-AR-909 EPA-460/3-74-003
Contract EPA-70-109

Descriptors: *Smoke, *Air pollution, Data processing, Exhaust emissions, Opacity, Tables(Data), Motor vehicles, Trucks, Buses(Vehicles), Test equipment, Tests, Exhaust gases, Gas analysis.
Identifiers: *Diesel engine exhaust, Air pollution standards.

The objective of this study was to determine the effectiveness of the Federal diesel smoke regulations in controlling smoke emissions from a group of heavy-duty diesel engines engaged in routine automotive service. A test consisting of 64 trucks and buses, powered by engines certified to meet 1970 smoke standards, was tested for smoke emissions at four-month intervals over a two-year period. Changes in smoke opacity observed during this test period were used to determine, to the extent possible, the effect of time, mileage, and type of service (or duty cycle) on opacity. A secondary project objective was to obtain baseline brake specific emissions data of unburned hydrocarbons, carbon monoxide, and oxides of nitrogen for the vehicles in the test fleet. Smoke opacity tended to increase with time or, equivalently, with mileage.

PB-232 701/3GA PC$8.75/MF$1.45
Oregon Advisory Committee to the State Land Board, Salem.
SUBMERGED AND SUBMERSIBLE LANDS OF OREGON.
Oct 70, 113p W74-08516, OWRR-C-2177(3378)(1)

Descriptors: *Tidelands, *Oregon, Land surveys, Public land, State land resources, Law(Jurisprudence), Lakes, Rivers, Shores, Public health, Water pollution, Air pollution, Conservation, Water rights, Water law.

The compilation relates to a study assigned by the Oregon Legislature to the Advisory Committee to the State Land Board. It is a preliminary work designed to provide a legal base for defining problems and proposing solutions to conflicting governmental jurisdictions, opposing claims of riparian ownership, overlapping authority of agencies, limits of navigation involving state ownership of beds and banks of Oregon's waterways and questions bearing on offshore authority and powers. The beds of navigable waterways and their banks, to the mean high water line, were granted to Oregon by the federal government at the time of statehood (1859). However, rivers, in their meandering routes to the sea have oscillated tremendously. Old banks and beds were abandoned, new ones created. These changes have occurred through the processes of accretion, erosion and avulsion, and the type of change involved often determines ownership of the river bed. Limits of navigability as they existed in 1859 also are confusing. The problems of tidelands, offshore submerged and submersible lands, and estuarine management are equally complex. This study is thus primarily pointed toward re-evaluation, clarification and revision of the above legal problems.

PB-232 702/1GA PC$5.00/MF$1.45
Southwest Research Inst., San Antonio, Tex.
DEVELOPMENT OF ANALYTIC TECHNIQUES TO MEASURE HUMAN EXPOSURE TO FUEL ADDITIVES.
Final rept.,
Donald E. Johnson, John B. Tillery, John M. Hosenfeld, and James W. Register. 1 Mar 74, 162p* EPA-650/1-74-003
Contract EPA-68-02-0595

Descriptors: *Exhaust gases, *Fuel additives, Adults, Surveys, Spectrophotometry, Chemical analysis, Exposure, Cadmium, Copper, Lead, Manganese, Zinc, Public health, Body fluids, Residues.
Identifiers: *Air pollution effects(Humans), Air pollution sampling, Body burdens.

The principal objective of the investigation has been to develop analytical and sampling methods to accurately measure human exposure to fuel additives. An additional objective was to obtain some preliminary information about the quantities of certain additive residues in body burdens of individuals exposed to relatively high concentrations of internal engine exhaust emissions. This project was designed to measure body burdens of five heavy metals, namely cadmium, copper, lead, manganese and zinc. Four substances (blood, urine, hair and feces) were selected to provide data on the total body burdens of these metals. Measurement of the metals in blood and urine provides an indicator of total body burdens and will also reflect short term exposure.

PB-232 709/6GA PC$3.75/MF$1.45
Arizona Dept. of Economic Planning and Development, Phoenix. Planning Div.
ARIZONA PLANNING PRIMER. A GUIDE FOR LOCAL GOVERNMENTS.
Final rept.,
Feb 74, 64p OEPAD-EP-74-2

Descriptors: *Urban planning, *Local government, *Arizona, Instructions, Law(Jurisprudence), Land use zoning, Highways, Flood plain zoning, Urban transportation, Parks, Parking facilities, Regulations, Residential buildings.

The purpose of this document is to introduce the subject of urban planning to the layman and to describe the requirements of a new state law governing planning by cities and towns. The planning process includes several steps beginning with description of community conditions and continuing through study of issues, goals and alternative actions to the preparation and implementation of a general plan. The participants in the process include the public, governing body, planning commission and staff, and others. The 1973 Urban Environment Management Act provides specific authority for cities and towns to do planning. If a community elects to engage in planning it must meet certain requirements such as the inclusion of certain elements in the general plan itself. Planning by conties, special districts, regional councils of government, and state and federal agencies takes place, although not under the authority of the Urban Environment Management Act.

PB-232 711/2GA PC$3.20/MF$1.45
Highway Research Board, Washington, D.C.
SYNTHESIS OF HIGHWAY PRACTICE: 23. GETTING RESEARCH FINDINGS INTO PRACTICE.
Final rept.
May 74, 36p* HRB-NCHRP-SYN-23, ISBN-0-309-02206-1
Report on National Cooperative Highway Research Program. Library of Congress Catalog Card No. 74-3532.

Descriptors: *Highway transportation, *Research management, Highway planning, Safety, Maintenance, Research, Development, Projects.

The report presents the results of a comprehensive review and analysis of existing information on the various procedures that have been employed by highway agencies under a wide variety of organizational structures to translate the results of research into practice. Most successful procedures were found to be constructed around the premise that effective implementation is a continuous process that begins at the earliest stage of planning of a research endeavor and remains active until utilization of the product of the endeavor is realized.

PB-232 716/1GA PC$3.20/MF$1.45
Highway Research Board, Washington, D.C.
SYNTHESIS OF HIGHWAY PRACTICE: 21. HIGHWAY LOCATION REFERENCE METHODS.
Final rept.
Apr 74, 42p* HRB-NCHRP-SYN-21, ISBN-0-309-02204-5
Report on National Cooperative Highway Research Program. Library of Congress Catalog Card No. 74-3529.

Descriptors: *Highway transportation, *Maintenance, *Sites, Identifying, Safety, Highway planning, Symbols.
Identifiers: *Highway location reference systems.

The report presents the results of a comprehensive review and evaluation of existing information on the current practices of highway agencies in the use of highway location reference methods to facilitate locating positions on the highway for such functions as planning, safety, and maintenance. Some emphasis is placed on methods used to establish locations at which accidents have taken place. No all-purpose location reference method, or broader system of field and office procedures of which any method is a part, was identified. The various methods found to be in use are described in sufficient detail for potential users to select, or devise adaptations of, those which best suit their individual needs. Areas where research could be profitable are identified.

PB-232 717/9GA PC$4.00/MF$1.45
Highway Research Board, Washington, D.C.
SYNTHESIS OF HIGHWAY PRACTICE: 22. MAINTENANCE MANAGEMENT OF TRAFFIC SIGNAL EQUIPMENT AND SYSTEMS.
Final rept.
May 74, 53p* HRB-NCHRP-SYN-22, ISBN-0-309-02205-3
Report on National Cooperative Highway Research Program. Library of Congress Catalog Card no. 74-3531.

Descriptors: *Vehicular traffic control, *Traffic signals, *Maintenance management, Reviews, Failure, Signal devices, Control, Financing, Manpower, Job analysis, Traffic engineering, Management systems.

The report presents the results of a comprehensive review and analysis of current practice in state and local highway organizations in executing management responsibilities for maintaining traffic signal equipment and systems. The management systems that are being used to provide routine maintenance, preventive maintenance, and emergency repairs are described in some detail. The technical problems of maintenance, although recognized as important, are not covered in depth.

PB-232 758/3GA PC$5.00/MF$1.45
Louisiana Office of State Planning, Baton Rouge.

THE STATE OF THE STATE IN 1974, AN ECONOMIC AND SOCIAL REPORT TO THE GOVERNOR.
Annual rept. no. 2.
1 May 74, 172p

Descriptors: *Regional planning, *Louisiana, Demography, Economic development, Industries, Housing studies, Agriculture, Recreation, Public health, Safety, Education, Expenses.

The report examines changing demographic characteristics in Louisiana, the vitality of the state economy and public sector services. Attention is focused on changes that have occurred and which can be documented since 1972.

PB-232 781/5GA PC$4.00/MF$1.45
Carnegie-Mellon Univ., Pittsburgh, Pa.
NUMERICAL ASPECTS OF POLLUTION ABATEMENT.
Final rept.,
Kenneth O. Kortanek. 12 Jun 74, 17p
Grant NSF-GK-31833

Descriptors: *Air pollution control, *Pennsylvania, Cost effectiveness, Standards, Optimization, Policies, Game theory, Climatology, Dissipation.
Identifiers: Air pollution abatement, Pittsburg(Pennsylvania), Allegheny County(Pennsylvania), Metropolitan areas.

Mathematical models were developed for optimizing air pollution abatement policies originally stemming from problems encountered in the Pittsburgh area. The basic problem is to determine how much should polluters reduce their emission rates in order to achieve desirable air quality throughout a geographic region according to any of a number of policy goals. Consequently, various cost effective air pollution control strategies can be suggested for a given geographic region, termed 'selective abatement procedures'. New computational schemes and computer codes were developed. Results of the project were applied to air pollution abatement problems in Allegheny County, and contributions were made to the formation of recent legislation on air pollution control in the county.

PB-232 819/3GA PC$4.00/MF$1.45
California State Office of the Attorney General, Los Angeles.
CALIFORNIA ATTORNEY GENERAL'S POSITION PAPER: LAND USE PLANNING.
Final rept.,
Evelle J. Younger. 28 Jan 74, 128p

Descriptors: *Regional planning, *California, *Land use, Management, Economic development, State government, Transportation, Housing legislation.

California, a leader in environmental planning and management has been moving towards statewide land use planning. The paper presents the California Attorney General's position on land use planning. The text of the paper endorses the development of a California conservation and development plan, and covers transportation needs, housing patterns, economic and social factors, development, legislative review, existing local plans, and public participation.

PB-232 834/2GA PC$3.00/MF$1.45
Arizona Water Resources Center, Tucson.
MODELING OF HYDROLOGIC PROCESSES AND WATER SALVAGE PROCEDURES IN SEMIARID REGIONS.
Partial Technical completion rept.,
S. D. Resnick. Dec 73, 9p W74-08702, OWRR-A-020-ARIZ(8)
Contract DI-14-31-0001-3203
See also PB-206 121.

Descriptors: *Water reclamation, *Hydrology, *Semiarid land, *Arizona, Water quality management, Benefit cost analysis, Industries, Agriculture, Recreation, Surface water runoff, Cooling water, Mathematical models, Linear programming, Waste water, Water treatment.
Identifiers: Water reuse, Tucson(Arizona).

Potential uses or reuses of salvageable waters in the Tucson region were examined, and costs and benefits related to such uses were evaluated. The quality of salvageable waters as determined in exploratory sampling was compared with water quality standards and criteria appropriate for agricultural, recreational and selected industrial uses. A tableau was then constructed which showed the type and estimated cost of conventional water treatment that would be required for each source-to-use combination. Finally, an estimate was made of unit net benefits to be anticipated from salvageable water input to these uses, and the net benefits were applied in several test calculations to illustrate mixed allocations of the various salvaged waters to the selected uses.

PB-232 885/4GA PC$6.50/MF$1.45
Tulsa Univ., Okla.
MATHEMATICAL MODEL FOR PREDICTING MIGRATION PATTERNS OF AQUEOUS WASTE RESOLUTIONS.
Open file rept.,
Gordon W. Thomas. Aug 73, 66p BuMines-OFR-27-74
Contract H0122118

Descriptors: *Water pollution control, *Industrial wastes, *Waste disposal, *Injection wells, Mathematical models, Adsorption, Kinetics, Pressure, Water supply, Oil reservoirs, Permeability, Mixing, Connate water, Petroleum industry, Gas reservoirs.
Identifiers: Liquid waste disposal.

Industrial waste products, in aqueous solutions, are frequently injected into disposal wells. Where injection of massive quantities of waste materials occurs over long periods of time, it is important to predict the migration patterns of the waste solutions, the reservoir pressures created, and the extent to which adsorption strips the waste solution of toxic materials. Desire for such information is predicated primarily on a concern for the effects that waste solution injection may have on both surface and subsurface fresh water supplies. Furthermore, it is also possible that waste solutions will migrate into adjacent hydrocarbon-bearing reservoirs and interfere with oil and gas production. The ability to predict conditions under which this might happen becomes paramount in planning and designing an injection project. It is possible to employ an immiscible reservoir simulator and with appropriate artifices, handle a miscible displacement process in a reasonable way. This report treats the development and application of such a model to the aqueous waste injection problem.

PB-232 930/8GA PC$14.25/MF$1.45
Pennsylvania Transportation Inst., University Park.
CONSTRUCTION AND TESTING OF AN EXPERIMENTAL PRESTRESSED CONCRETE BRIDGE.
Interim rept. no. 1, Sep 71-Dec 72,
Robert M. Barnoff, and James A. Orndorff, Jr. 15 Mar 74, 224p PTI-7407
Report on an Experimental Prestressed Concrete Bridge. Sponsored in part by Pennsylvania Dept. of Transportation, Harrisburg. Bureau of Materials, Testing and Research, and Federal Highway Administration, Washington, D.C.

Descriptors: *Bridge decks, *Performance tests, *Loads(Forces), Prestressed concrete, I beams, Highway bridges, Wood, Composite materials, Concrete slabs, Test methods, Deflection, Strains, Durability, Pennsylvania.

An experimental prestressed concrete I-beam bridge has been constructed as an integral part of the Pavement Durability Test Track Facility at The Pennsylvania State University. This two-span bridge has been instrumented and is being tested to evaluate the behavior of two different deck types. One span of the bridge was constructed with a conventional reinforced concrete composite slab. Wood forms were used on one-half the span, and metal stay-in-place forms on the other half. The other span was constructed with precast, prestressed concrete plank forms, topped with cast-in-place concrete. Instrumentation consisted of strain gages on the slab and beams and deflectometers on the beams. The bridge was loaded with a semi-trailer truck having maximum wheel loads of 17 kips. Measurements indicated that composite action was developed between the concrete plank and the cast-in-place topping. Full composite action was also developed between the beams and deck for both spans. (Modified author abstract)

PB-232 933/2GA PC$4.50/MF$1.45
Harvard Univ., Cambridge, Mass.
TASSIM: A TRANSPORTATION AND AIR SHED SIMULATION MODEL, VOLUME I. CASE STUDY OF THE BOSTON REGION.
Final rept. 1 Apr 73-31 May 74,
Gregory K. Ingram, and Gary R. Fauth. May 74, 107p* DOT-OS-30099-5
Contract DOT-OS-30099
See also PB-232 934.

Descriptors: *Transportation management, *Air quality, *Urban transportation, Computerized simulation, Atmospheric diffusion, Transportation models, Government policies, Air pollution, Motor vehicles, Land use, Cost effectiveness.
Identifiers: Emission factors, Boston(Massachusetts), *Air pollution abatement, Stationary sources, TASSIM computer program.

The TASSIM model integrates an urban transportation planning model, vehicle emission factors, and simple air diffusion models in a simulation framework that can be used to analyze the air quality effects of transportation policies. The model is spatially disaggregated, and it is compatible with data sources available in many metropolitan areas. This volume briefly describes the structure of the model and then analyzes several model applications that simulate for Boston the air quality effects of transportation control land use, and stationary source policies. The transportation control policies are evaluated in a cost effectiveness framework. The final sections consider possible extensions of the model and outline the model's computational aspects.

PB-232 934/0GA PC$5.75/MF$1.45
Harvard Univ., Cambridge, Mass.
TASSIM: A TRANSPORTATION AND AIR SHED SIMULATION MODEL. VOLUME II. PROGRAM USER'S GUIDE.
Final rept.,
Gregory K. Ingram, Gary R. Fauth, and Eugene A. Kroch. May 74, 201p* DOT-OS-30099-6
Contract DOT-OS-30099
See also PB-232 933.

Descriptors: *Computerized simulation, *Air quality, *Urban transportation, Computer programming, Calibration, Subroutines, Air pollution, Computer programs, FORTRAN, Atmospheric diffusion, Coding.
Identifiers: Emissions factors, *Air pollution abatement, TASSIM computer program.

The TASSIM model integrates an urban transportation planning model, vehicle emission factors, and simple air diffusion models in a simulation framework that can be used to analyze the air quality effects of transportation policies. The model is spatially disaggregated, and it is compatible with data sources available in many metropolitan areas. Designed to aid others in using TASSIM, this volume describes the computer pro-

gramming steps in the model, the input data required by various subprograms, and the procedures used to calibrate the model to a metropolitan area. The volume also includes an outline of the programming changes needed to simulate various policies, and a listing of the model's FORTRAN code.

PB-232 941/5GA PC$5.95/MF$1.45
Chase, Rosen and Wallace, Inc., Alexandria, Va.
THE STATE OF THE SYSTEM(SOS), MODEL: MEASURING GROWTH LIMITATIONS USING ECOLOGICAL CONCEPTS.
Socioeconomic Environmental studies series,
Edward R. Williams, and Peter W. House. Feb 74, 353p W74-07958, EPA-600/5-73-013
Contract NSF-GS-03S-38351
Paper copy also available from GPO $3.45 as stock no. EP1.23:660/5-73-013.

Descriptors: *Regional planning, *Environmental management, *Land development, Mathematical models, Urbanization, Natural resources, Economic factors, Population growth, Allocations, Algorithms, Nutrients, Food chains.
Identifiers: Quality of life, State of the System Model, *Ecosystems.

The State of the system (SOS) model is the result of an attempt to develop a methodology that relates ecological concepts including regional carrying capacity to the social scientists' concepts of regional growth and development, and quality of life. SOS should be considered at this time as only a conceptual research tool. The initial operational model, SOS-1, was developed to investigate details of the results predicted by the theory, and to explore data requirements and needs. Therefore, the results of the model runs provided are purely illustrative and should be interpreted using extreme care. The SOS Model began as an attempt to provide an example form of constrictor model of the Decision Analysis System (DAS) to be used in conjunction with the General Environmental Model (GEM). It is intended that the later developments of SOS should complete this development as a constrictor model within DAS as well as continue its refinement as a stand-alone analysis tool. The model, as given in the SOS-1 form, is flexible and new data and algorithms can be substituted with relative ease. In order to maintain this ease in later, more complex versions, segmentation of its procedures into smaller modules would be useful. Such a form will increase the utility of SOS as an educational and research tool.

PB-232 955/5GA PC-GPO/MF$1.45-NTIS
International City Management Association, Washington, D.C.
ENVIRONMENTAL MANAGEMENT AND LOCAL GOVERNMENT.
Socioeconomic environmental studies series,
Steve Carter, Murray Frost, Claire Rubin, and Lyle Sumek. Feb 74, 404p W74-08827, EPA-600/5-73-016
Grant EPA-R-801374
Paper copy available from GPO $3.80 as stock no EP1.23:600/5-73-016.

Descriptors: *Environmental surveys, *Local government, *Urban planning, *Pollution, Government policies, Land use, Strategy, Ordinances, Attitude surveys, Taxes, Water pollution, Air pollution, Solid waste disposal.
Identifiers: Citizen participation.

The results are presented of a study of environmental management and local government. The study has two main components: A survey of chief executives in cities over 10,000 population and counties over 50,000; and, a series of field studies of local environmental management in Dallas, Texas; Inglewood, California; Miamisburg, Ohio; and the Piedmont Triad Region (Forsyth and Guilford Counties), North Carolina. The major topics include: Perception of the definition of environment, priority of environment as a local policy issue, and types of environmental problems facing each local government; adoption of local policy statement on the environment; existence of citizen environmental boards, environmental agencies, environmental sections in master plans, land use controls, other environmental controls, moratoria, environmental quality standards, environmental impact assessment procedures, environmental law suits, tax incentives and penalty charges; factors contributing to and factors creating obstacle to development of environmental programs; and, relations with state and federal agencies.

PB-233 000/9GA PC$7.00/MF$1.45
California State Div. of Highways, Sacramento. Transportation Lab.
CALIFORNIA SKID RESISTANCE STUDIES.
Final rept.,
John A. Apostolos, Robert N. Doty, Bobby G. Page, and George B. Sherman. Feb 74, 76p CA-DOT-TL-3126-9-74-10

Descriptors: *Pavements, *Skid resistance, Friction, Surface properties, Texture, Covering, Polishing, Correlation techniques, Grooving, Bauxite, Test equipment, Test methods, California.

A correlation between skid test values and surface texture measurements was made. The Modified Sand Patch test exhibited poor correlation and poor repeatability. The Outflow Meter test exhibited fair-to-good correlation with high-speed skid numbers on PCC pavements, and this test showed good to excellent repeatability. Further testing and evaluation is recommended in order to establish Outflow Meter requirements for the surface texture of new PCC pavements. Before-and-after studies of a pavement overlaid with calcined bauxite chip seal showed a dramatic increase in skid numbers, but no significant change in the accident frequency.

TT-72-54022/4 PC$4.00
Environmental Protection Agency, Washington, D.C.
AIR CONSERVATION. VOLUME 5, NUMBER 4(24), 1971.
1974, 80p
Unedited trans. of Ochrona Powietrza (Poland) v5 n4(24) 1971, by A. Skup. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Air pollution, Lime cements, Utilization, Iron and steel industry, Fly ash, Air filters, Scientific research, Translations, Poland, Catalysts, Oxidation, Hydrocarbons.
Identifiers: Air pollution abatement, Environmental quality, Sinks(Biosphere).

Contents:
- Some aspects of the environment pollution control;
- The quality coefficients of the fabric air filters;
- Agrobiological purification of the atmosphere and of the soil in the nitrogen and sulfur industries;
- Fly ash for the manufacture of a hydraulic lime-cement;
- Emission abatement project for the iron and steel industry. Catalytic purification of the atmosphere air.

TT-72-54022/5 PC$4.00
Environmental Protection Agency, Washington, D.C.
AIR CONSERVATION. VOLUME 5, NUMBER 5(25), 1971.
1973, 84p
Unedited trans. of Ochrona Powietrza (Poland) v5 n5(25) 1971, by Z. Kaminski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Air pollution, Scrubbers, Exhaust gases, Iron and steel industry, Sulfur dioxide, Dust, Scientific research, Translations, Poland, Materials recovery, Atmospheric composition.
Identifiers: Air pollution detection, *Air pollution control.

Contents:
- Measurements of the concentration of dust in the atmosphere;
- Distribution of atmospheric pollution in the Puszcza Niepolomicka region;
- Analysis of sulfur dioxide emission into the atmosphere from three iron and steelworks;
- Sulfur recovery from sulfated and wet gases;
- Investigation on neutralization of sulfur compounds in combustion gases discharged to the atmosphere;
- Porosity of the drip area in scrubbers.

TT-72-54022/6 PC$4.00
Environmental Protection Agency, Washington, D.C.
AIR CONSERVATION. VOLUME 5, NUMBER 6(26) 1971.
1974, 82p
Trans. of Ochrona Powietrza (Poland) v5 n6(26) 1971, by Z. Kaminski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Air pollution, Dust filters, Dust control, Blast furnaces, Hydrogen cyanide, Steel plants, Translations, Poland, Fluid flow, Iron and steel industry.

Contents:
- A possibility of supplying power to the electrofilters for power boilers by means of electric impulses;
- Indices of emission of pollutants to the atmosphere from the rolling mills of iron and steel works;
- Results of investigation on reduction of SO2 emission to the atmosphere at the Witkowice Steel Works;
- Atmospheric contamination with hydrogen cyanide from blast-furnace gas pollution plants;
- Formation of the profile of gas velocity and dust concentration of gas pipes.

TT-72-54023/6 PC$4.00
Environmental Protection Agency, Washington, D.C.
AIR CONSERVATION. VOLUME 6, NUMBER 6(32), 1972.
1973, 81p
Unedited trans. of Ochrona Powietrza (Poland) v6 n6(32) 1972, by Z. Kaminski. The above journal is translated on a regular basis. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Air pollution, Oxidation, Catalysts, Translations, Dust, Atmospheric composition, Dust collectors, Sulfur dioxide, Poland.
Identifiers: *Air pollution control, Scientific research.

Contents:
- Dry ammonia method for utilization of sulfur dioxide in diluted gases;
- Theoretical analysis and test results of a mechanical-electric dust separator;
- Spatial distribution of sulfur dioxide and dust concentration in the atmospheric air;
- Parameters of SO2 sorption in an anion exchanger.

13C. Construction Equipment Materials, and Supplies

PB-232 559/5GA PC$3.75/MF$1.45
Battelle Columbus Labs., Ohio.
SCRAP RUBBER TIRE UTILIZATION IN ROAD DRESSINGS.
Final rept.,
Benson G. Brand. Mar 74, 51p EPA-670/2-74-014
Grant EP-00500-01

Descriptors: *Flexible pavements, *Composite materials, *Automobile tires, Mixtures, Emulsification, Reclamation, Feasibility.
Identifiers: *Reclaimed rubber, Scrap recycling.

Research to demonstrate the feasibility of using rubber from discarded passenger car tires in water-thinnable emulsions of asphalt or coal tar for blacktop dressings for driveways, etc., was conducted. Nine different compositions containing from 5 to 25% rubber were applied to field test site. After one year of continuous exposure in a high traffic area, the performance of the experimental compositions appeared to be as good as control samples. No attempts at composition optimization were made but complete feasibility of the basic idea was successfully demonstrated.

PB-232 614/8GA PC$5.25/MF$1.45
Minnesota Dept. of Highways, St. Paul. Office of Research Coordination.
SHRINKAGE COMPENSATING CEMENTS WITH ADDITIVES.
Special study (Final) on Phase 2,
H. J. Gillis. 1973, 42p MN-HW-5-180-73-9, SS-299-2
See also PB-208 991.

Descriptors: *Cement additives, *Shrinkage, *Concrete durability, Bridge decks, Minnesota.

This report describes a laboratory evaluation of the physical characteristics of shrinkage compensating cements when additives are used. Two admixtures were studied, Dow Corning 777B, a reactive polysiloxane, which increases the durability or resistance to weathering, and Sika Set, a low-shrinkage, final set accelerator. The concrete used was a standard Minnesota Highway Department bridge deck design mix (3Y43). The two additives generally improved the physical characteristics of the ChemComp shrinkage compensating cement but greatly reduced the durability of the concrete in the freeze-thaw tests. (Modified author abstract)

PB-232 888/8GA PC$4.75/MF$1.45
California State Div. of Highways, Sacramento. Transportation Lab.
ASPHALT CORE SAMPLING AND RECOVERY TECHNIQUES.
Highway research rept.,
Nelson H. Predoehl, Glenn R. Kemp, and George B. Sherman. Dec 73, 31p CA-DOT-TL-3134-16-73-44

Descriptors: *Highways, *Flexible pavements, *Sampling, Field tests, Performance evaluation, Asphalt, Extraction, Carbnols.

The effect of sample size (number of core sites per sample), sampling location (within and between wheel paths in passing or travel lane), and the substitution of methanol as part of the solvent used in the Abson recovery process were investigated. The study involved taking additional cores from the Ludlow Test Section and comparing the results. Statistical methods were employed to determine the confidence interval based on the penetration test results. The findings indicate that a minimum of four core sets per test area are necessary to insure an adequate sample of a section. The substitution of methanol in the Abson recovery does not appear to produce any significant benefits.

13F. Ground Transportation Equipment

AD-780 375/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SPECIAL CARGO,
V. Chertkov. 19 Apr 74, 5p Rept no. FTD-HT-23-1800-74
Edited trans. of Pravda, Moscow (USSR) n257 p6, 14 Sep 73, by Bernard L. Tauber.

Descriptors: *Rail transportation, *Cargo, Railroads, Materials handling vehicles, Weight, Translations, USSR.

PAT-APPL-479 638 PC$4.00/MF$1.45
Department of Transportation, Washington, D.C.
EMERGENCY LIGHTING FOR PUBLIC TRANSPORTATION VEHICLES.
Patent Application,
Anthony T. Newfell, and Williams J. Malone.
Filed 17 Jun 74, 11p DOT/Case-TSC-10057
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Mass transportation, *Lighting equipment, *Patent applications, Patents, Reserve batteries, Electrolytes, Circuits.
Identifiers: *Emergency lighting.

The patent application concerns an electrical lighting system for mass transportation vehicles including an auxiliary, solar powered set of emergency lights located at strategic positions within the vehicle. When needed, the emergency lights are powered by gel cell batteries that are trickle charged during other periods by a plurality of solar panels located in the roof of the vehicle.

PATENT-3 780 784 Not available NTIS
Department of the Air Force Washington D C
EXPANDABLE TIRE RETAINER ASSEMBLY.
Patent,
Carl P. Spier. Filed 7 Jun 72, patented 25 Dec 73, 5p Rept nos. PAT-APPL-260 646,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Holders, *Patents, Tires, Expandable structures, Assembly.
Identifiers: PAT-CL-157-1.

The patent describes a retainer assembly for use with expandable tires wherein a pair of circular metallic bands having a plurality of tabs extending radially outward therefrom are positioned around the wheel rims such that the tabs are located nearly adjacent the tire beads. A hollow spreader bar is positioned between the bands at each tab location and a headed stud is passed through the tab inwardly into the spreader bar to maintain the tabs in spread condition which, in turn, holds the tire beads against the tapers or flanges of the wheel rim during the mounting process and would also operate to retain the tire on the wheel if and when an emergency 'run-flat' condition existed.

PB-232 515/7GA PC$8.75/MF$1.45
Mueser Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION, SECTIONS B009, B010 AND B011, GLENMONT ROUTE.
Rept. no. 12.
10 May 74, 112p MRWJ-74-105

Descriptors: *Subway railways, *District of Columbia, *Routes, *Subsurface investigations, Foundations, Rock mechanics, Soil mechanics, Tunneling(Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning.
Identifiers: Foundation engineering, *Glenmont Route, Design section B009, Design section B010, Design section B011.

Results are summarized of 35 deep test borings made for the investigation of alternative schemes for the Washington Metropolitan Area METRO line in Sections B009, B010, and B011 of Glenmont Route generally following Georgia Avenue from the District of Columbia line to the community of Glenmont. The report contains a continuous longitudinal geological section incorporating the boring information, logs of these test borings, results of tests performed on soil and rock samples recovered and a test summarizing anticipated design and construction problems for the several alternative positions of the METRO structures being considered.

PB-232 529/8GA PC$4.25/MF$1.45
Mueser, Rutledge, Wentworth and Johnston, New York.
SUBSURFACE INVESTIGATION, BROOKLAND STATION SECTION B006, GLENMONT ROUTE.
Rept. no. 8.
24 May 74, 25p MRWJ-74-106

Descriptors: *Subway railways, *District of Columbia, *Railroad stations, *Subsurface investigations, Foundations, Rock mechanics, Tunneling(Excavation), Subsurface structures, Boring, Subsoil, Urban transportation, Mass transportation, Urban planning.
Identifiers: Foundation engineering, *Brookland Station, *Glenmont Route, Design section B006.

Results are summarized of six supplementary test borings made to investigate conditions at the planned Brookland Station of the Washington Metropolitan Area METRO System between Monroe and Michigan Avenues N. E. along the B and O Railroad Metropolitan Branch in Section B006 of Glenmont Route. The report contains a longitudinal geological section along the station centerline, a detailed section along the Michigan Avenue bridge adjacent to planned deep excavations, logs of the test borings, results of laboratory tests performed on samples obtained and a brief text summarizing anticipated design and construction problems.

PB-232 537/1GA PC$3.75/MF$1.45
National Highway Safety Administration, Riverdale, Md. Safety Systems Lab.
DYNAMOMETER TEST FOR REPLACEMENT BRAKE LINING STANDARD.
Interim rept. Aug 71-Oct 73,
John D. Preston. May 74, 56p DOT-HS-801-133

Descriptors: *Brake linings, *Standards, *Automobiles, *Test methods, Replacing, Maintenance, Dynamometers, Evaluation, Performance.

The brake linings or pads with which new vehicles are equipped generally require replacement at about 1/3 of the total vehicle mileage. A Federal standard is under consideration to establish minimum performance requirements for replacement linings and pads. The paper describes a method of evaluating brake lining performance using a single end inertia brake dynamometer.

PB-232 652/8GA PC$6.50/MF$1.45
Ultrasystems, Inc., Phoenix, Ariz. Dynamic Science Div.
VEHICLE FRONT END STRUCTURE CRASH EVALUATION PROGRAM. VOLUME II. TECHNICAL REPORT.
Final rept. Jul 72-Dec 73,
L. Maurice Shaw, Allen D. Harper, and Robert L. Anderson. May 74, 262p Dynamic Science-2310-73-160-Vol-2 DOT-HS-801 129
Contract DOT-HS-046-2-486
See also Volume 1, PB-231 823.

Descriptors: *Automobiles, *Crash tests, *Safety engineering, Bumpers, Structural properties, Impact tests, Performance evaluation, Safety devices, Collision research, Design standards, Computerized simulation.

Identifiers: *Crashworthiness.

The report presents the results of a research program conducted to determine the crash response characteristics of two front end structure systems. Computer simulations of each structure and crash environment were conducted using an existing computer crash simulation program. The two front end structures, a ramped fixed-force system and a variable stroke velocity-sensitive system, were incorporated into bogey vehicles which were crashed into a rigid barrier, a variable rigidity barrier, and production vehicle front and side structures. The test results provided data by which computer simulation of the crash conditions was verified. The empirical data were extended to other crash environments using the computer simulation techniques.

PB-232 700/5GA PC$3.25/MF$1.45
Minnesota Univ., Minneapolis. Center for Urban and Regional Affairs.
PLATOON-OPERATED STATIONS FOR QUASI-SYNCHRONOUS PERSONAL RAPID TRANSIT NETWORKS,
Jack L. Dais, and Harold L. York. Sep 73, 30p
UMTA-MN-11-0003-73-6

Descriptors: *Rapid transit railways, *Urban transportation, *Computerized simulation, *Automatic control, Railroad stations, Synchronism, Networks, Numerical analysis, Passenger terminals.
Identifiers: *Personal rapid transit systems, *Dual mode transportation.

The report focuses on the management and simulation of captive vehicles in a personal rapid transit (PRT) or dual-mode transit (DMT) system. The simulation of a station for a quasi-synchronous network is presented. Quasi-synchronous systems allow slot slipping or advancing at interchanges to avoid merge conflicts. Vehicles ar dispatched from stations with the first slot that can converge without conflict at the immediate merge point. The report is a computer simulation of vehicle operations in an off-line, single ramp personal rapid transit station. The major results of interest to station designers are the curves relating throughput to the total number of berths in the station and queue areas. Curves corresponding to .5% and 1% abort rates are exhibited.

13G. Hydraulic and Pneumatic Equipment

AD-780 213/5GA PC$3.00/MF$1.45
Navy Experimental Diving Unit Washington D C
HIGH PRESSURE ENGINEERING CO., INC. H. P. AIR COMPRESSOR 6-CFM 'HURRICANE MODEL HPE 3000-7-L55',
J. V. Harter. 31 Jul 65, 24p Rept no. NEDU-Evaluation-4-65

Descriptors: *Scuba diving, *Air compressors, Fatigue(Mechanics), Failure(Mechanics), Safety, Endurance(General).
Identifiers: HPE 3000-7L55 compressors.

The High Pressure Engineering Company, Incorporated, H. P. Air Compressor 6-CFM was evaluated to determine its suitability for U. S. Navy use as a protable air compressor. The unit tested was found to be unsatisfactory due to its inability to undergo a complete evaluation. A series of material failures occurred during the various attempts to operate the compressor. The test and evaluation was terminated after the motor to compressor drive shaft fractured due to fatigue failure. The cause of the various failures was excessive vibration of the prime mover being transmitted directly to the compressor. (Author)

13H. Industrial Processes

AD-780 034/5GA PC$3.25/MF$1.45
Pennsylvania State Univ University Park Dept of Industrial Engineering
ELEVATED TEMPERATURE MACHINING OF HIGH STRENGTH ALLOYS.
Summary rept.,
Alfred O. Schmidt. Mar 74, 39p* RIA-R-TR-74-011
Contract DAAF01-70-C-0686

Descriptors: *Machining, *High strength alloys, Steel, High temperature, Heating.
Identifiers: Steel 4340, Steel 4150.

Hot-machining tests in turning, boring, and milling were conducted on AISI 4340, AISI 4150, and on manganese steel workpieces to improve the shaping of both conventional and difficult-to-machine alloys. The workpieces were heated during the machining operations by one of three methods, namely a sliding electrode, a TIG torch, and friction elements. Test tool materials were of various types of ceramics, tungsten-titanium carbides, titanium carbides, and titanium-coated carbides. Cutting force measurements were made with a three-component dynamometer. (Modified author abstract)

AD-780 455/2GA PC$3.00/MF$1.45
Aluminum Co of America Alcoa Center Pa
PROGRAM TO DEVELOP HIGH STRENGTH ALUMINUM POWDER METALLURGY PRODUCTS. PHASE IV. SCALE UP TO 3200 LB. BILLETS.
Quarterly rept. no. 6, 20 Dec-19 Dec 73, on Phase 4,
W. S. Cebulak. 26 Apr 74, 23p
Contract DAAA25-72-C-0593
See also AD-904 979.

Descriptors: *Powder metallurgy, *Aluminum alloys, High strength, Powder alloys, Compacting, Isostatic pressing, Hot pressing, Billets, Extrusion, Vacuum apparatus.

Preheating with Ar or no gas flow followed by evacuation and vacuum hot pressing gave P/M wrought products with high fracture toughness only when the vacuum can temperature was maintained above 800F. Vacuum preheating and vacuum hot pressing imparted high toughness in P/M wrought products for can temperatures from 600F to 820F. MA87 extrusions from compacts preheated below the alloy solidus gave higher transverse fracture toughness than earlier extrusions preheated above the solidus temperature.

LA-UR-74-113 PC$5.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
MECHANICAL FABRICATION, HEAT TREATMENT, AND MACHINING OF URANIUM ALLOYS.
J. F. Boland, and D. J. Sandstrom. 1974, 59p
CONF-740205-10
Contract W-7405-eng-36

Descriptors: (*Uranium base alloys, *Fabrication), Heat treatments, Machining, Reviews, Uranium-gamma.

For abstract, see NSA 29 12, number 30056.

PATENT-3-774 291 Not available NTIS
Department of the Air Force Washington D C
EXPLOSIVE BONDING OF TUBES TO FITTINGS.
Patent,
Jack T. Snyder, Donald M. McLarty, and Stephen L. Kenley. Filed 4 Aug 72, patented 27 Nov 73, 5p
Rept nos. PAT-APPL-277 956,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Explosive welding, *Patents, Tubes, Fittings, Bonding.
Identifiers: PAT-CL-29-421, Dissimilar materials bonding.

The patent describes a method of explosively joining tubes to fittings by first inserting the tube into a double tapered hole bored in the fitting and then positioning a close fitting wooden dowel having a charge of sheet explosive wrapped therearound in the tube under the tapered area. The double tapered cavity between the outer wall of the tube and the fitting is then evacuated by withdrawing the air therefrom and the explosive is detonated causing the tube to expand radially outward against the wall of the double tapered cavity producing a high integrity bond between the tube and the fitting.

PB-232 889/6GA PC$3.75/MF$1.45
Oklahoma State Univ., Stillwater.
INDUSTRIAL ENGINEERING SOFTWARE LIBRARY.
Final rept. 1 Mar 73-28 Feb 74,
Hamed Kamal Eldin. Dec 73, 72p
Grant NSF-GK-37354

Descriptors: *Industrial engineering, *Computer systems programs, *Libraries, Meetings.

There appears to be a real need for a central clearinghouse for Industrial Engineering Software. With financial assistance from the NSF, the author has investigated the feasibility of establishing an Industrial Engineering Software Library (IESL). This was conducted through: (1) A seminar/workshop attended by participants from Government Agencies, practicing engineers, university professors, software consultants and computer center professionals - the seminar participants discussed technical and economic feasibility; (2) A questionnaire sent to a representative sample of industrial engineering (1500), to investigate significant items related to library such as service required, type of software...etc. The report covers the recommendations of seminar and results of questionnaire.

13I. Machinery and Tools

AD-780 211/9GA PC$3.25/MF$1.45
Navy Experimental Diving Unit Washington D C
COMPARATIVE EVALUATION OF POWDER ACTUATED STUD DRIVING TOOLS FOR UNDERWATER USE,
G. M. Janney, and C. M. Prickett. 18 Feb 59, 33p
Rept no. NEDU-Evaluation-10-59

Descriptors: *Underwater tools, *Propellant actuated devices, *Underwater equipment, Divers, Performance(Engineering), Corrosion inhibition.
Identifiers: *Stud drivers, *Powder actuated tools.

Powder actuated, stud driving tools were submitted by three different manufacturers for a comparative evaluaton. The purpose of this evaluation was to determine the underwater operating capabilities, the relative ease of operation, and the safety characteristics of each of the tools. The evaluation consisted of laboratory type performance tests and a limited subjective evaluation. Two of the tools were found to be satisfactory and were recommended for field evaluation. The other tool was determined to be unsuitable for use by a diver. (Author)

AD-780 388/3GA Not available NTIS
Defence Standards Labs Maribyrnong (Australia)
WEAR DAMAGE TO SPUR GEARS,
R. A. Cummins, E. D. Doyle, and B. Rebecchi. 7 Aug 73, 7p
Availability: Pub. in Wear, v27 p115-120 1974.

Descriptors: *Gears, Wear, Damage, Fatigue(Mechanics), Friction, Roll, Electron microscopy, Australia.
Identifiers: *Spur gears.

Electron microscopic studies of damage to spur gears in an experimental gearbox have shown that rolling contact fatigue plays a major role supplemented by abrasive wear. It is noteworthy that the most voluminous part of the wear debris consisted of extremely fine particles of thickness below 0.2 micrometers. (Author)

AD-780 378/6GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A DEVICE FOR THE MECHANIZATION OF LAYING CABLE,
N. F. Edunov, Yu. V. Bushuev, and Yu. S. Melnikov. 24 May 74, 6p Rept no. FTD-HT-23-2053-74
Edited trans. of Patent (USSR) 347 851 p1-2 1972, by Michael L. Seidel.

Descriptors: *Conveyors, Electric cables, Installation, Supports, Patents, Translations, USSR.

The object of the invention is a device for mechanized laying of cable which contains an endless traverse rope with cable support elements and linear bearings with installed pulleys. For the purpose of reducing the force of pulling of on the cable during its transport, the given pulleys are installed on the linear bearing with an axial inclination from the horizontal at an angle of 15-25 degrees and equipped with a flange with a toothed rim for passage of support elements, made in the form of detachable ring of flexible cord.

AD-780 453/7GA PC$3.75/MF$1.45
Skf Industries Inc King of Prussia Pa Research Lab
PROGRESSION OF SURFACE DAMAGE IN ROLLING CONTACT FATIGUE.
Final rept. May 73-Apr 74,
H. Dalal, G. Cotellesse, F. Morrison, and N. Ninos. Feb 74, 67p Rept no. SKF-AL74TO02
Contract N00014-73-C-0464

Descriptors: *Antifriction bearings, *Monitoring, Nondestructive testing, Fatigue(Mechanics), Friction, Roll, Monitors, Damage, Pulse analyzers, Wear, Detection, Surfaces, Failure, Spallation, Defects(Materials), Test equipment.

Deep groove 6309 ball bearings were tested under heavy load in MIL-L-23699 lubricant using an ultraclean closed loop recirculating lubrication system in which the only metallic wearing component was the test bearing. A limited amount of Ferrographic analysis on the oil samples obtained from these tests has not established a definite correlation between Ferrogram readings and bearing failure progression. The discrimination of the Shock Pulse Analyzer (MEPA) to differentiate between a failed and non-failed bearing was confirmed. The shock value increased from 500 or less on a running bearing to 1000 or more on a failed bearing. (Modified author abstract)

PATENT-3 769 672 Not available NTIS
Department of the Air Force Washington D C
METHOD OF MAKING AN IMPROVED TEFLON-LINED SPHERICAL BEARING.
Patent,
Phillip R. Eklund. Filed 31 Jul 72, patented 6 Nov 73, 7p Rept nos. PAT-APPL-276 338,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Roller bearings, *Patents, Linings, Laminates, *Teflon, Metals, Bonding.
Identifiers: *PAT-CL-29-149-5-B.

The patent consists in a method of making a metal-backed teflon laminate that includes, in unique combination, a metal backing, preferably of stainless steel, and a relatively thin, metal-filled teflon layer or skiving bonded to the metal backing under predetermined conditions of temperature (630F) and pressure. The teflon liner is for use with spherical/self-aligning and other bearings.

PATENT-3 774 280 Not available NTIS
Department of the Air Force Washington D C
METHOD OF FABRICATING HOLLOW BALLS FOR USE IN ROLLING CONTACT BEARING APPLICATIONS.
Patent,
Phillip R. Eklund, and Gabe L. Campbell. Filed 18 Jul 72, patented 27 Nov 73, 8p Rept nos. PAT-APPL-273 004,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Ball bearings, *Fabrication, *Patents, Antifriction bearings, Spinning(Industrial processes), Mechanical working, Forming techniques, Spheres.
Identifiers: PAT-CL-29-148-4-B.

The patent relates to a means for fabricating a seamless hollow ball by initially spin-forging a metal tube into a non-spherical structure that is hollow and closed except for a pair of equatorial or diametral openings. The process simultaneously and progressively shapes the initially formed structure into a spherical hollow ball and eliminates the openings by a controlled plastic deformation.

PB-232 295/6GA PC$5.75/MF$1.45
Rutgers - The State Univ., New Brunswick, N.J. Dept. of Mechanical, Industrial and Aerospace Engineering.
THE ANALYSIS AND SYNTHESIS OF POLYCENTRIC MECHANISMS.
Final rept.,
John R. Steffen, and Terry E. Shoup. Mar 74, 220p
RU-TR-143-MIAE-D
Grant NSF-GK-35521

Descriptors: *Machine design, *Kinematics, Torque, Centroids, Moire effects, Graphic methods, Computer programs.

The investigation presents both analytical and experimental methods of analyzing the fixed centrode curves of a class of six, plane, four-link mechanisms. A family of centrode curves is included for each mechanism along with the computer plotting programs. A photo-optical technique, based on Moire' fringe patterns, is presented for the experimental determination of the pole of motion for a general two dimensional kinematic displacement. Synthesis equations are presented for each of the six mechanisms previously analyzed. These equations permit the dimensional synthesis for up to seven precision conditions for points specified on the fixed centrode. (Modified author abstract)

13J. Marine Engineering

AD-779 844/0GA PC$4.00/MF$1.45
Naval Ship Research and Development Center Bethesda Md
DIVERGENCE ANALYSIS OF SWEPT HYDROFOILS-COMPUTER PROGRAM (SWDIVRG).
Final rept.,
John R. Caspar. Apr 74, 79p Rept no. NSRDC-4245

Descriptors: *Hydrofoil craft, *Hydrofoils, FORTRAN, Bending moments, Torsion, Lifting surfaces, Hydrodynamics, Mathematical models, Computer programs.
Identifiers: FORTRAN 4 programming language, SWDIVRG computer program.

A systematic approach is described by which divergence characteristics of swept or unswept hydrofoils may be calculated. The computer program, called SWDIVRG, developed to do the calculations makes use of a lumped-parameter approach, resulting in a matrix solution of the system. The bending and torsional displacements any of N stations along the hydrofoil span can be calculated at speeds less than divergence. Bending and torsional moments can be calculated for the condition of cantilever-beam constraints. The divergence spe d is principally computed by an eigenvector iteration scheme. A convenient formulation and a plot are provided for estimating the hydrodynamic loading parameters for finite-span, surface-piercing hydrofoils. Also, a useful closed-form divergence formulation, which considers submergence level, has been derived for the special case of a uniform cantilever strut or foil. Test calculations of airfoil models and one hydrofoil model, using both SWDIVRG and the closed-form solution, show good agreement with experimental model-divergence speeds. (Author)

AD-779 864/8GA PC$7.50/MF$1.45
Naval Ship Research and Development Center Bethesda Md
RESISTANCE OF HARD-CHINE, STEPLESS PLANING CRAFT WITH SYSTEMATIC VARIATION OF HULL FORM, LONGITUDINAL CENTER OF GRAVITY, AND LOADING,
E. Nadine Hubble. Apr 74, 350p Rept no. NSRDC-4307

Descriptors: *Planing surfaces, *Hulls(Marine), Hydrodynamics, Resistance, Loads(Forces), Geometry, Center of gravity.
Identifiers: *Chines, Trimming characteristics, Design criteria.

Smooth-water resistance and trimming characteristics are presented for 22 planing craft hulls representing systematic variations of chine planform, length-beam ratio, and deadrise angle. Resistance-weight ratios and trim angles have been derived from model experimental data at comparable speed and loading conditions as a function of the location of the longitudinal center of gravity in order to facilitate optimization in small craft design. (Author)

AD-779 866/3GA PC$11.00/MF$1.45
Hydronautics Inc Laurel Md
1200 PSI STEAM PROPULSION PLANT IMPROVEMENT PROGRAM BOILER LAY-UP PROCEDURES PAST, PRESENT AND PROPOSED CONCEPTS.
Technical rept.,
Anthony St. George. Jul 73, 159p Rept no. TR-7205-1
Contract N00014-72-C-0342

Descriptors: *Boilers, Ships, Naval equipment, Maintenance, Corrosion inhibition, Additives, Feed water, Dehumidifiers, Hydrazine.

The requirement for intermittent operation of Naval propulsion boilers requires that special attention be given to the problem of idle boiler care. Evidence has shown that improperly secured boilers are subject to very rapid deterioration from both waterside and fireside corrosion processes and that when these conditions are permitted to exist the expected results will be loss of boiler tubes and costly repairs. The importance of proper care as a preventive maintenance item prompted an investigation of the Navy's present procedures for the care of idle boilers. Two major recommendations have been made as a result of this work. One is the concept of fireside dehumidification and the other is the use of hydrazine as a boiler water oxygen scavenger.

AD-779 881/2GA PC$3.75/MF$1.45
Naval Training Equipment Center Orlando Fla
ASSAULT BOAT EQUATIONS COMPUTER PROGRAMMING.
Final rept.,
Harvey C. Saltzman. May 74, 57p Rept no. NAVTRAEQUIPC-IH-219

Descriptors: *Landing craft, *Simulators, *Computer programming, Naval personnel, Naval training, Amphibious operations, Training devices, Digital simulation, FORTRAN.
Identifiers: LCM 6 vessel, FORTRAN 4 programming language.

A study was conducted to develop computer software pertinent to the development of a Navy Assault Boat Coxswain Trainer. Existing equations of an LCM(6) (medium landing craft) have been combined with a mathematical representation of a wave-beach environment in a real-time digital computer program. The study used a Xerox Sigma 7 computer at the Naval Training Equipment Center connected to a boat mockup and experimental visual display generating hardware. The program provides a basis for studies to determine the motion and visual display requirements of an assault boat simulator. (Author)

AD-780 065/9GA PC$4.00/MF$1.45
Stevens Inst of Tech Hoboken N J Davidson Lab
WAVE LOADS IN A MODEL OF THE SL-7 CONTAINERSHIP RUNNING AT OBLIQUE HEADINGS IN REGULAR WAVES.
Final rept.,
J. F. Dalzell, and M. J. Chiocco. 1973, 79p Rept no. SIT-DL-71-1613 SSC-239
Contract N00024-71-C-5489

Descriptors: *Cargo ships, *Ocean waves, Sea states, Dynamic loads, Bending moments, Ship models, Ship motion, Shear properties.
Identifiers: SL-7 vessel, *Containerships.

Vertical, lateral and torsional wave bending moments, and vertical and lateral shears were measured at two sections of a 1/140-scale model of the SL-7 containership. The model was self-propelled through a ship speed range of 24 and 32 knots at seven headings to regular waves of lengths between 0.25 and 2.0 times the length between perpendiculars. Motions were also measured. Two ship conditions: light and full load were covered. Results are presented in charts of load or motions amplitude/wave amplitude vs. wave length and phase lag vs. wave length, with heading, ship speed and loading condition as parameters. (Author)

AD-780 090/7GA PC$3.25/MF$1.45
Teledyne Materials Research Waltham Mass
DESIGN AND INSTALLATION OF A SHIP RESPONSE INSTRUMENTATION SYSTEM ABOARD THE SL-7 CLASS CONTAINERSHIP S.S. SEA-LAND MCLEAN.
Technical rept.,
R. A. Fain. Jun 73, 46p Rept no. E-1395(b) SSC-238
Contract N00024-73-C-5059

Descriptors: *Cargo ships, *Instrumentation, Shipboard, Marine engineering, Ship motion, Response, Ships, Transducers, Electric cables, Consoles, Detectors.
Identifiers: *Container ships, Sea-Land McLean Vessel.

The report describes the transducers, cabling, signal-conditioning, and recording elements of the instrumentation system installed aboard the SL-7 Containership S.S. SEA-LAND McLEAN. It includes a detailed summary of the strain-gage bridge circuits, locations of all transducers, and a description of the various operating modes and options available for recording data from more than 100 strain gages, accelerometers, and motion sensors. (Author)

AD-780 210/1GA PC$4.50/MF$1.45
Navy Weather Research Facility Norfolk Va
AN INITIAL SURVEY OF ENVIRONMENTAL EFFECTS UPON AMPHIBIOUS OPERATIONS.
Technical paper,
J. D. Jarrell, and T. H. Gainer. Jun 68, 26p Rept no. NAVWEARSCHFAC-TP-13-68

Descriptors: *Amphibious operations, *Environments, Ocean waves, Ocean currents, Ocean tides, Wind, Surf, Close support.

The report identifies those facets of amphibious operations wherein environmental influences predominate and which are critical to successful accomplishment, and ascertains the availability of data sources suitable for determining quantitative relationships between operational effectiveness and environmental severity.

COM-74-11123/8GA PC$9.25/MF$1.45
MSA Research Corp., Evans City, Pa.
TANKER TANK CLEANING RESEARCH PROGRAM.
Final rept. on Phase 1,
William J. Cooper. 11 Mar 74, 474p* MSAR-74-36 MA-RD-900-74017
Contract C-2-36279
Prepared in cooperation with Keystone Shipping Co., Philadelphia, Pa.

Descriptors: *Petroleum transportation, *Tanker ships, *Cleaning, Washing, Hazards, Safety, Water pollution, Specialized training, Atmosphere contamination control.
Identifiers: *Oil pollution control.

This report presents the findings of an 18-month evaluation of crude oil tankship tank cleaning and related operations. Data from industry surveys, shipboard studies and laboratory investigations were used to provide a state-of-the-art review and to develop recommendations/guidelines that will increase the safety of tank cleaning operations, reduce the oil pollution of the oceans and reduce the cost and effort involved in tank cleaning. Major report sections review and evaluate equipment and operational procedures employed in tank washing, slop separation and handling, and tank atmosphere control. Specific findings emphasize the importance of training of tanker operational personnel. Guidelines for improved training programs are provided, as well as recommendations for further research and development.

JPRS-62085 PC$6.50/MF$1.45
Joint Publications Research Service, Arlington, Va.
RADIOCYBERNETIC METHODS FOR CONTROLLING MARINE OBJECTS,
K. Yu. Agranovskii. 24 May 74, 262p
Trans. of mono. Radiokiberneticeskie Metody Upravleniya Morskimi Obektami, Leningrad, 1967 p3-33, 72-181, 269-363.

Descriptors: *Underwater objects, *Remote control, Underwater ordnance, Marine engineering, Cybernetics, Radio telemetry, Automation, USSR, Translations.

The report contains general information on methods of automatic control of marine objects including the structure of design and physical operating principles, control signals, noise resistance and recognition.

PB-233 042/1GA PC$4.00/MF$1.45
Mitsubishi Heavy Industries, Ltd., Tokyo (Japan).
NEW SHIP STRENGTH RESEARCH LABORATORY OF MHI NAGASAKI TECHNICAL INSTITUTE.
Mitsubishi technical bulletin,
Masahiro Mori, Keisuke Kono, and Shinjiro Takai. Apr 74, 11p MTB-89

Descriptors: *Ships, *Naval architecture, *Structurual design, Fatigue tests, Buckling, Data processing, Japan.

With the advent of recent technological innovations in shipbuilding there are many complicated problems of ship structural design. Especially, the structural safety of ships is now the matter of grave concern. It should no longer be discussed in terms of empirical engineering, but it should be handled in terms of absolute judgement on the structural safety based on correct evaluation of ocean conditions.

13K. Pumps, Filters, Pipes, Fittings, Tubing and Valves

AD-779 832/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EJECTING CAPACITY OF EJECTOR WITH MIXING CHAMBER,
V. V. Bondarenko, V. G. Lisienko, and B. I. Kitaev. 23 Apr 74, 12p Rept no. FTD-HT-23-808-74
Edited trans. of Voprosy Sovershenstvovaniya Stroitelstva. Sbornik Nauchnykh Trudov (USSR) n91 p207-212 1971, by Marilyn Olaechea.

Descriptors: *Ejectors, Mixing, Furnaces, Air ejectors, Translations, USSR.

The aim of the studies is to explain the effect of geometrical parameters on the work of ejectors with a short mixing chamber under conditions of isothermality and equal densities in the ejecting and ejected mediums.

AD-780 052/7GA PC$3.25/MF$1.45
Army Air Mobility Research and Development Lab Fort Eustis Va Eustis Directorate
HOSE CHAFE GUARD TESTS.
Technical rept.,
Donald R. Artis, Jr. Apr 74, 37p Rept no. USAAMRDL-TR-74-34

Descriptors: *Helicopters, *Hoses, Abrasion, Hydraulic equipment, Protective coatings, Protective coverings, Braids, Shielding, Wear resistance.

The report presents the results of a series of tests conducted to determine the operational suitability of using nylon 6/6 spiral cut tubing (coil) as a hose chafe guard on Army helicopters. These tests were part of a follow-on effort recommended in USAAMRDL Technical Report 72-1. The test effort was divided into five areas: Coil back-off tests; flight tests; temperature/wear tests; fluid compatibility tests; and ozone, aging, and fungus investigations. Test results and material investigation indicated that nylon 6/6 spiral cut tubing is a good hose chafe guard for the temperature band from -65 degrees to 225 degrees F, and it is recommended for retrofit to Army helicopters where temperatures do not exceed those bounds. (Author)

PAT-APPL-381 329 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
METHOD OF MAKING LONG LENGTH, SEAMLESS POROUS TUBES AND RODS.
Patent Application,
John K. Thorne. Filed 20 Jul 73, 19p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Tubes, *Rods, *Patent applications, Porous materials, Powder metallurgy, Sintering, Fabrication, Stainless steels.
Identifiers: PAT-CL-75-226.

The patent application concerns an improved method which permits seamless porous tubing to be made in long lengths and with uniform wall thicknesses, uniform density, and smooth walls. Metal powder is placed in the annular space between two concentric tubes, or a tube and a rod, which have their ends closed together. A room temperature tube reduction operation compresses and elongates the powder and tubes, after which the composite assembly is then heated to cause the metal powder particles to sinter together. Following sintering, which may be done in a reactive atmosphere since the concentric cladding tubes serve to protect the powder from the atmosphere, the inner and outer tubes are removed.

PB-232 935/7GA PC$7.50/MF$1.45
Council for Scientific and Industrial Research, Pretoria (South Africa). Chemical Engineering Group.

INTERACTION BETWEEN ADJACENT T-JUNCTIONS IN A DIVIDING FLOW MANIFOLD.
Special rept.,
G. A. Parr. Nov 73, 88p CSIR-SR-CENG-020, ISBN-0-7988-0458-0

Descriptors: *Pipeline transportation, *Pipe fittings, *Manifolds, Turbulent flow, Pipe flow, Pipes(Tubes), Fluid flow, Intersections, Interactions, South Africa.

The experimental system comprised water flowing under turbulent flow conditions in circular cross-section pipes with two sharp-edged, right-angled tee-junctions. The independent variables investigated were lateral spacing, angular displacement (0 degrees or 180 degrees) and split flow ratio. The effect of interaction was considerable and increased as the separation of the lateral branches decreased. The angle of rotation of one lateral with respect to the other was also found to have a marked effect on the head change distribution pattern.

13L. Safety Engineering

AD-779 878/8GA PC$4.00/MF$1.45
Naval Ammunition Depot Crane Ind
AN EVALUATION OF FIVE RAILROAD ENGINE ALERTING AND WARNING LIGHT SYSTEMS,
Mark S. Sanders, Charles E. Aylworth, and John D. OBenar. 28 Feb 74, 81p Rept no. NAD-CR-RDTR-265

Descriptors: *Warning systems, *Lighting equipment, *Safety, Locomotives, Beams(Radiation), Light, Stroboscopes, Flashes, Colors, Clearances.

Five lighting systems proposed for improved other-vehicle operator approach warning - alerting were evaluated in a simulated grade crossing decision paradigm. Additional evaluations were conducted on system conspicuousness. The systems, a Bicolor Radial Beacon, Slow-rate Strobe 2.5 flash per second (FPS), Fast-rate Strobe 1 FPS, truck clearance lights, and side mounted Flourescent Panels, were examined at 10, 20, 30 miles per hour under daylight and night conditions. Some advantage was found for the strobe systems and for the clearance lights as compared to the usual fixed locomotive headlight. Recommendations for further research were made. (Author)

COM-74-50534/8GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Technical Analysis Div.
APPLICATION OF SYSTEMS ANALYSIS TO THE OPERATION OF A FIRE DEPARTMENT.
Final rept.,
Ernst K. Nilsson, Joseph A. Swartz, and Marilyn Westfall. Jun 74, 55p NBS-TN-782
Library of Congress Catalog Card no. 74-600079.
Paper copy available from GPO $0.90 as C13.46:782.

Descriptors: *Fire departments, *Position(Location), Fire fighting, Operations research, Mathematical models, Simulation, Virginia, Management.
Identifiers: Alexandria(Virginia).

Rising labor costs and increasing competition for tax dollars to provide urban services demand that a more precise methodology be used in the management of fire departments. A pilot program was conducted with the cooperation of the Alexandria, Virginia Fire Department to evaluate the applicability and usefulness of selected operations research tools. These tools, in the form of computer models, were modified and adapted to assure that they could be implemented to provide information which would facilitate fire department management. In this effort queueing, facility location, and simulation models were applied to sample data extracted from the historical records of the Alexandria Fire Department. This paper describes the city of Alexandria and its fire department, the O.R. models, output from their application, and evaluations of the output.

PATENT-3 775 762 Not available NTIS
Department of the Air Force Washington D C
GAS MULTIPLICATION ULTRAVIOLET DETECTOR SYSTEM FOR FIRE DETECTION.
Patent,
Terry M. Trumble. Filed 15 Sep 72, patented 27 Nov 73, 7p Rept nos. PAT-APPL-289 713,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Fire detectors, *Patents, Photomultiplier tubes, Ultraviolet detectors.
Identifiers: PAT-CL-340-228-R.

The patent describes a fire detection system using an ultraviolet gas multiplication detector, an amplitude discriminator to differentiate between a fire and cosmic radiation, and a time base discriminator to differentiate between a fire and background noise, provides a sensitive, highly reliable, fire detecting system.

PB-232 892/0GA PC$13.00/MF$1.45
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
TRI-LEVEL ACCIDENT INVESTIGATION SUMMARIES. LEVEL 3A. INJURY CAUSATION. VOLUME 1. NUMBER 4.
Summary rept.
Sep 72, 200p DOT-HS-600 979
Contract FH-11-7098
See also PB-209 071.

Descriptors: *Motor vehicle accidents, *Accident investigations, Collision research, Injuries, Automobile bodies, Safety engineering, Design standards.

The report briefly introduces and describes the Tri-Level Accident Investigation concept. Basically, three levels of information are collected: (1) Exposure and accident rate information; (2) accident information on a large sample of accidents not normally collected by the police; (3) multidisciplinary in-depth information collected on a small sample of accidents by a team of professionals. The report specifically contains Level 3A accident summaries from the Tri-Level Study. The summaries are brief descriptions of injury-producing accidents investigated to determine the specific injuries incurred and identify the specific interior components which caused such injuries. The volume contains summaries of 50 injury Causation cases.

PB-232 893/8GA PC$13.75/MF$1.45
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
TRI-LEVEL ACCIDENT INVESTIGATION SUMMARIES. LEVEL 3-A. INJURY CAUSATION. VOLUME 1, NUMBER 7.
Summary rept.
Sep 72, 211p DOT-HS-600 982
Contract FH-11-7098
See also PB-216 059.

Descriptors: *Motor vehicle accidents, *Accident investigations, Collision research, Injuries, Automobile bodies, Safety engineering, Design standards.

The report briefly introduces and describes the Tri-Level Accident Investigation concept. Basically, three levels of information are collected: (1)Exposure and accident rate information; (2) accident information on a large sample of accidents not normally collected by the police; (3) multidisciplinary in-depth information collected on a small sample of accidents by a team of professionals. The report specifically contains Level 3A accident summaries from the Tri-Level Study. The summaries are brief descriptions of injury-producing accidents investigated to determine the specific injuries incurred and identify the specific interior components which caused such injuries. The volume contains summaries of 50 Injury Causation cases.

PB-232 894/6GA PC$13.25/MF$1.45
Cornell Aeronautical Lab., Inc., Buffalo, N.Y.
TRI-LEVEL ACCIDENT INVESTIGATION SUMMARIES. LEVEL 3-A. INJURY CAUSATION. VOLUME 1. NUMBER 8.
Summary rept.
Sep 72, 202p DOT-HS-600 983
Contract FH-11-7098
See also PB-232 893.

Descriptors: *Motor vehicle accidents, *Accident investigations, Collision research, Injuries, Automobile bodies, Safety engineering, Design standards.

The report briefly introduces and describes the Tri-Level Accident Investigation concept. Basically, three levels of information are collected: (1) Exposure and accident rate information; (2) accident information on a large sample of accidents not normally collected by the police; (3) multidisciplinary in-depth information collected on a small sample of accidents by a team of professionals. The report specifically contains Level 3A accident summaries from the Tri-Level Study. The summaries are brief descriptions of injury-producing accidents investigated to determine the specific injuries incurred and identify the specific interior components which caused such injuries. The volume contains summaries of 50 Injury Causation cases.

PB-232 936/5GA PC$5.75/MF$1.45
Maryland Medical Legal Foundation, Inc., Baltimore.
MMF - FINAL REPORT 1972: MULTIDICIPLINARY ACCIDENT INVESTIGATION. VOLUME I.
Rept. for 1 Jan 72-20 Aug 73,
R. S. Fisher, I. M. Sopher, and W. C. Masemore.
Jan 74, 206p DOT-HS-801 141
Contract DOT-HS-198-2-316
See also Volume 2, PB-232 937.

Descriptors: *Motor vehicle accidents, Accident investigations, Collision research, Injuries, Human factors engineering, Automobiles, Highways, Design standards, Safety engineering, Urban areas, Traffic safety, Autopsy, Toxicity, Maryland.
Identifiers: Baltimore(Maryland).

The report describes the methodology, results, conclusions and recommendations pertaining to the investigation of 53 vehicular accidents occurring in Greater Baltimore metropolitan area from January, 1972 to August, 1973. Thirty-three fatal and 20 non-fatal accidents were investigated, involving 26 in-depth and 27 limited scope multidisciplinary investigations. Particular emphasis was placed upon the human factor aspect of the vehicle accident. The investigations included vehicle and scene examination, autopsy findings on fatal victims, toxicological data and psychosocial evaluations of the 'at fault' driver population. Evaluation of and recommendations regarding the current Federal Highway and Motor Vehicle Safety Standards are included. Portions of this document are not fully legible.

PB-232 937/3GA PC$8.25/MF$1.45
Maryland Medical Legal Foundation, Inc., Baltimore.
NMF - FINAL REPORT 1972: MULTIDICIPLINARY ACCIDENT INVESTIGATION. VOLUME II.
Rept. for 1 Jan 72-20 Aug 73,
R. S. Fisher, I. M. Sopher, and W. C. Masemore.
Jan 74, 378p DOT-HS-801 142
Contract DOT-HS-198-2-316
See also Volume 1, PB-232 936.

Descriptors: *Motor vehicle accidents, *Accident investigations, Collision research, Injuries, Human factors engineering, Automobiles, Highways, Design standards, Safety engineering, Urban areas, Traffic safety, Maryland.
Identifiers: Baltimore(Maryland).

Volume II is a compendium of the case summaries of 53 vehicular accidents occurring in Greater Baltimore metropolitan area from January 1972 to August 1973.

13M. Structural Engineering

AD-780 051/9GA PC$3.25/MF$1.45
Cold Regions Research and Engineering Lab Hanover N H
MEASUREMENT OF FORCES WITHIN THE STRUCTURAL FRAME OF DEW LINE ICE CAP STATIONS DYE-2 AND DYE-3.
Special rept.,
Wayne Tobiasson, Herbert Ueda, and Gary Hine. Apr 74, 43p Rept no. CRREL-SR-205

Descriptors: *Radar stations, *Cold regions, Construction, Engineering, Structural properties, Loads(Forces), Stresses, Greenland, Ice caps, Frames, Structures.
Identifiers: Dew line.

Regional straining of the ice cap and differential settlement and tilt of footings has induced secondary loads into the structural frame of these facilities. These loads have been measured using hydraulic cylinders at sway bolt interaction points. The measurements indicate that large secondary loads exist within these facilities. It is recommended that structural components be analysed in detail to assess the influence of the measured loads on the integrity of each structure. (Author)

AD-780 059/2GA PC$34.00/MF$1.45
Army Engineer School Fort Belvoir Va
NONTACTICAL BRIDGING FOR THE FIELD ARMY - 1980.
Final rept.,
Terry C. Ryan, and Edward L. McDowell. 1 Apr 74, 619p

Descriptors: *Military equipment, *Military bridges, Military engineering, Planning, Cost effectiveness, Bridges, Life cycles.

The study is to determine the preferred nontactical gap-crossing bridge system(s) and to recommend the most cost effective to be fielded by 1980 for two theaters of operation. It is also to serve as the basis for continuing development and acquisition. The approach is to simulate the terrain and combat environments in which the bridges must be constructed. Once bridges have been designed, a reliable statistical sample of main supply routes are constructed to obtain an optimized bridge type mix. Various decisional information on the bridge mixes is also provided. (Author)

COM-74-50270-03/GA PC-GPO/MF$1.45-NTIS
Bureau of Domestic Commerce, Washington, D.C.
CONSTRUCTION REVIEW. VOLUME 20, NUMBER 3, APRIL 1974.
Monthly rept.
Apr 74, 64p
Paper copy available from GPO $11.50/year, $1.00/copy as C41.30/3:20.3.

Descriptors: *Construction, Reviews, Construction materials, Residential buildings, Licenses, Contracts Prices, Employment, Expenses.
Identifiers: *Construction Review.;

Contents: Construction; The economy; Construction developments in 1973; Statistical data on construction put in place, housing, building permits, contract awards, costs and prices, construction materials, and contract construction employment.

PAT-APPL-465 384 PC$4.00/MF$1.45
Department of the Interior, Washington, D.C.
SELF-TIGHTENING INFLATABLE ARCH.
Patent Application,
Ray L. Hauser. Filed 19 Apr 74, 7p
DOCKET/MIN-1948
Government-owned invention for licensing. Copy of application available NTIS.

Descriptors: *Supports, *Inflatable structures, *Patent applications, Mines, Tents, Construction materials.
Identifiers: PAT-CL-52-2.

The patent application describes a self-tightening inflatable arch used as a supporting structure that becomes tighter as the inflating pressure increases. The arch has two joined layers of fabric materials that form a closed chamber and shrink in different directions such that the outer layer stretches in an axial direction while the inner layer shrinks in the axial direction. This causes the total arch structure to form a rigid tight surface whose strength increases with pressures. A complete system consists of a series of parallel arcuate chambers joined together with an appropriate valve member. This can be used to support tunnels, temporary buildings, or as mine supports.

PB-232 519/9GA PC$4.75/MF$1.45
Cornell Univ., Ithaca, N.Y. Dept. of Structural Engineering.
COUPLED SHEAR WALLS. IMPROVED METHODS FOR ELASTIC ANALYSIS.
Research rept. Sep 73-Feb 74,
Riadh Saleh Al-Mahaidi, and Arthur H. Nilson. Feb 74, 147p* 355
Grant NSF-GK-40184

Descriptors: *Earthquake resistant structures, *Walls, Elastic analysis, Aspect ratio, Loads(Forces), Structural analysis, Reinforced concrete, Stresses, Theses.
Identifiers: Finite element analysis, *Shear walls.

This report represents a critical review of methods for the elastic analysis of coupled shear walls, and describes certain improvements for the two methods most commonly used. The laminar method, based on the Beck-Rosman approach, is presented and a modification is introduced to account for the shear deformations in the wall. This has been neglected by previous investigators. A finite element scheme is developed which idealizes the walls by plane stress elements and the coupling beams as line elements in flexure. The continuity of displacements at the junction of coupling beams and walls, is satisfied by imposing constraint conditions through use of the technique of Lagrange multipliers. This scheme is compared with another finite element scheme, which idealizes the coupling beams by plane stress elements. The Lagrange multipliers finite element scheme and the laminar method were applied to analyze five prototype structures having different apsect ratios. The results obtained indicate that the two methods compare very well for high aspect ratios. For low aspect ratios, the laminar method is significantly in error.

PB-232 938/1GA PC$6.25/MF$1.45
Department of Housing and Urban Development, Washington, D.C. Policy Development and Research.
CREATING A NATIONAL MARKET FOR INNOVATION IN BUILDING. PART II. JUSTIFYING STRONG FEDERAL ACTION.
Draft rept.,
Steven R. Rivkin. 15 Jun 73, 65p HUD-PDR-141
See also PB-229 889. Prepared in cooperation with Nicholson and Carter, Washington, D.C.

Descriptors: *Building standards, *Federal policies, *Legislation, Legal opinions, Methodology, Housing market, Relevance, Management information systems, Factor analysis, Economic factors, Recommendations, Evaluation, Regulations, State government.
Identifiers: *Housing and urban development research, *Innovations, Alternatives.

The paper sets forth the legal and practical framework for authorizing federal building regulation legislation and notes its relevance to the broad legislative alternatives previously identified. An analysis of recent court cases is given, by which federal powers may preempt areas of traditional jurisdiction under state police powers. Subsequently, the paper reviews and analyzes presently available economic and administrative justifications for such legislative enactments, essential both to support the proposal of new legislation and to guide the initial choice of direction by a resulting federal administration.

PB-232 965/4GA PC$3.75/MF$1.45
Syracuse Univ., N. Y. Dept. of Mechanical and Aerospace Engineering.
THEORETICAL STRESS AND STIFFNESS DATA FOR DISCRETELY ATTACHED CORRUGATED SHEAR WEBS WITH CURVILINEAR CORRUGATIONS.
Technical rept.,
Lung-Hsiang Wu, and Charles Libove. May 74, 67p MAE-5170-T2
Grant NSF-GK-35814

Descriptors: *Plates(Structural members), *Corrugating, Shear properties, Stiffness, Strains, Elastic theory, Bend properties.

Theoretical numerical data are presented for the shear stiffness of corrugated shear webs with discrete attachments to framing members at the ends of the corrugations, and for the maximum transverse extreme-fiber flexural strains due to the cross-sectional deformations which arise during the shearing of such webs. The corrugation cross section is curvilinear with crests and troughs composed of identical circular arcs. Four kinds of discrete attachments are considered at the ends of the corrugations, namely (a) point attachments in the troughs, (b) point attachments in the troughs and at the crests, (c) point attachments at mid-height, and (d) point attachments in the troughs, at the crests, and at mid-height. The material is taken to be linearly elastic and isotropic.

UCRL-Trans-10710 PC$5.45/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SELECTED TRANSLATIONS OF SELECTED ARTICLES ON EXPLOSIVELY CONSTRUCTED DAMS.
96p
Translated from Vzryvnoe delo--Sbornik No. 69/26, Moscow, 1970.

Descriptors: (*Dams, *Construction), (*Chemical explosions, *Uses), Chemical explosives, Excavation, Ussr, Water reservoirs.

For abstract, see NSA 29 12, number 29267.

14. METHODS AND EQUIPMENT

14B. Laboratories, Test Facilities, and Test Equipment

AD-779 859/8GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
AN ELECTRONIC INTEGRATOR FOR TRANSIENT SHOCK SIGNATURES.
Technical rept.,
Luigi A. Vagnoni. 14 Mar 74, 19p Rept no. NOLTR-74-54

Descriptors: *Integrators, Shock waves, Signatures, Transients, Shock(Mechanics), Analyzers, Velocity.

The report describes an electronic integrator developed for use in obtaining velocity-time signatures from transient shock signatures. The integrator consists of three assemblies: an integrator circuit, a square wave calibrator, and a triggered relay control circuit. Both real time and magnetically taped data can be accommodated. The output is scaled to convert the input in units of acceleration in g to provide an output in units of velocity in feet per second. A brief background discussion and typical operational procedures are presented. (Author)

AD-779 894/5GA PC$3.00/MF$1.45
Royal Aircraft Establishment Farnborough (England)
ADAPTATION OF AN AMSLER VIBROPHORE FOR NARROW BAND RANDOM LOADING.
Technical rept.,
A. W. Cardrick, and G. J. Crewe. Feb 74, 20p Rept no. RAE-TR-73173 DRIC-BR-39689

Descriptors: *Test equipment, Fatigue(Mechanics), Loads(Forces), Random vibration, Spectra, Great Britain.
Identifiers: *Fatigue tests.

Details are presented of modifications to an Amsler Vibrophore fatigue testing machine to provide a narrow band random loading capability. The machine can be used to apply a Rayleigh distribution of amplitudes and also to synthesize service load spectra by adding together several distributions with different rms levels.

AD-780 128/5GA PC$4.00/MF$1.45
Drexel Univ Philadelphia Pa Dept of Mechanical Engineering and Mechanics
ULTRASONIC PROCEDURES FOR THE DETERMINATION OF BOND STRENGTH.
Interim scientific rept.,
Joseph L. Rose, and Paul A. Meyer. Jun 74, 97p AFOSR-TR-74-0779
Grant AF-AFOSR-2480-73

Descriptors: *Adhesion, *Bonded joints, *Ultrasonic tests, Composite materials, Wave propagation, Thickness, Measurement, Stresses.
Identifiers: Performance evaluation.

Theoretical wave propagation models that treat ultrasonic wave interaction with an adhesively bonded system have been developed. These models allow the selection of appropriate ultrasonic transducers for bond inspection analysis. Such problems as a variation in bondline thickness, the presence of density gradients in the adhesive bond and improper surface preparation are treated in detail. Preliminary results indicate that the potential for success appears quite high for obtaining a correlation between a bond performance parameter and some specific ultrasonic test parameter. (Author)

AD-780 231/7GA PC$10.75/MF$1.45
Panametrics Inc Waltham Mass
MEASUREMENT OF ELASTIC MODULI OF MATERIALS AT ELEVATED TEMPERATURE.
Final rept.,
C. A. Carey, E. H. Carnevale, J. Chen, K. A. Fowler, and G. S. Larson. 31 May 74, 570p
Contract N00014-73-C-0023
See also AD-763 763.

Descriptors: *Nondestructive testing, *Ultrasonic tests, *Modulus of elasticity, Ultrasonic radiation, Acoustic attenuation, High temperature.
Identifiers: Pulse echo techniques, *Ultrasonic thermometry, Ultrasonic spectroscopy.

Ultrasonic measurement of elastic properties of solids at elevated temperature comprises the central theme in the report of some twelve years of R and D under the support of the ONR Acoustics Branch. The principal methods used were momentary contact with pressure coupling, for bulk specimens of cross-sectional dimensions large compared to wavelength, and continuous contact, with welded joints, for wires and rods of cross-sectional dimensions small compared to wavelength. The bulk specimens were tested with broadband pulses or rf bursts having frequencies typically above 1 MHz. The wires were tested with pulses having 0.1 MHz as a typical center frequency. Other topics include: transducers, velocimetry, spectrum analysis, infrasonic measurements of moduli in plastic tensile test specimens, measurement of polymerization, and applications of ultrasonics such as nondestructive testing, acoustic emission, thermometry, flowmetry and process control. (Modified author abstract)

AD-780 236/6GA PC$12.50/MF$1.45
Eg and G Inc Albuquerque N Mex Albuquerque Div
EMP SIMULATORS FOR MISSILES AND AIRPLANES,
M. K. Bumgardner, M. A. Dreger, J. C. Giles, and G. F. Ross. 4 Feb 74, 186p Rept no. EG/G-AL-1026
Contract N60921-73-C-0033

Descriptors: *Electromagnetic pulse simulators, Selection, Test methods, Guided missiles, Aircraft.
Identifiers: Design.

The manual is intended as a guide to EMP (electromagnetic pulse) Simulator selection. Descriptions of EMP Simulators were collected from a large number of documents and up-dated. Detailed technical discussions of 16 operating simulators are given along with cost and schedule information. Cost estimates for the construction of various types of simulators are also provided. Technical and financial information is summarized in table form for quick reference. A general discussion of the EM criterion pulse and EMP simulation is included as an aid for evaluating simulator performance. (Author)

AD-780 327/3GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Chemistry
SOME PROBLEMS IN INFRARED SPECTROPHOTOMETRY,
R. N. Jones, D. Escolar, J. P. Hawranek, P. Neelakantan, and R. P. Young. 1973, 23p NRC-13331
Availability: Pub. in Jnl. of Molecular Structure, v19 p21-42 1973.

Descriptors: *Infrared spectrophotometers, *Spectrophotometry, Reflection, Refraction, Calibration, Precision, Accuracy, Errors, Canada.

It is well known that infrared intensity measurements are not very accurate. Nevertheless modern infrared spectrophotometers do exhibit good reproducibility, at least over small time intervals. Failure to obtain closer inter-laboratory agreement must result from systematic instrumental errors and faulty experimental technique. This review considers several aspects of the problem.

AD-780 348/9GA PC$3.00/MF$1.45
Royal Armament Research and Development Establishment Fort Halstead (England)
AN INVESTIGATION INTO THE EFFECTS OF SCATTERED RADIATION UPON IMAGE SHARPNESS AND CONTRAST USING COBALT-60 GAMMA RADIATION AND STEEL PLATES IN THE THICKNESS RANGE 20 TO 100 MM,
M. Dowd, and R. Halmshaw. Mar 74, 16p Rept no. RARDE-Memo-1/74 DRIC-BR-40264

Descriptors: *Radiography, Optical images, Gamma ray scattering, Radioactive isotopes, Cobalt, Contrast, Resolution, Radiographic film, Steel, Gamma rays, Great Britain.
Identifiers: Cobalt 60.

The effect of scattered radiation generated in the specimen, on the image of detail on a radiograph, was studied, using Cobalt-60-gamma-rays and steel plates. It is found, contrary to some other published work, that there is no effect on image sharpness, due to the scattered radiation. (Author)

AD-780 374/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
A DEVICE FOR DETERMINING THE ROTATIONAL DERIVATIVES OF MODELS STUDIES IN AERODYNAMIC INSTALLATIONS,
S. M. Belotserkovskii, A. A. Bedenko, and L. A. Odnovol. 19 Apr 74, 6p Rept no. FTD-HT-23-1619-74
Edited trans. of Patent (USSR) 190 634 p1-2, 29 Dec 66, by Robert D. Hill.

Descriptors: *Wind tunnel models, Rotation, Patents, Instrumentation, Translations, USSR.

AD-780 382/8GA Reprint
Toronto Univ (Ontario) Inst for Aerospace Studies
STRONG PLANAR SHOCK WAVES GENERATED BY EXPLOSIVELY DRIVEN SPHERICAL IMPLOSIONS.
Interim rept.,
I. I. Glass, S. K. Chan, and H. L. Brode. 22 Oct 73, 11p AFOSR-TR-74-0827
Grant AF-AFOSR-2274-72
Prepared in cooperation with R and D Associates, Santa Monica, Calif. Revision of report dated 18 Jun 73.
Availability: Pub. in AIAA Jnl., v12 n3 p367-374 Mar 74.

Descriptors: *Implosions, *Shock waves, Shock tubes, Hypervelocity, PETN, Gas dynamics, Mathematical models, Canada.

Implosions were used to raise the pressure and temperature of a driver gas to extreme values. Strong planar shock waves were thereby generated. A theoretical and experimental study was conducted on the performance of a 2.54-cm-diam shock tube driven by a 20-cm-diam hemispherical implosion driver. The analytical performance of the shock tube was predicted by numerically solving the set of governing nonlinear partial differential equations including appropriate loss mechanisms in the different regimes of the flow. (Modified author abstract)

AERE-R-7338 PC$4.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
INFRA-RED BURN-OUT DETECTOR.
D. N. Benn, and R. A. W. Shock. Feb 74, 10p

Descriptors: (*Two-phase flow, *Burnout), (*Tubes, Burnout), (*Pyrometers, *Performance), Heat transfer, Infrared radiation, Measuring methods, Performance testing.

For abstract, see NSA 29 12, number 29236.

COM-74-11062/8GA PC$4.75/MF$1.45
National Bureau of Standards, Washington, D.C. Inst. for Materials Research.
STANDARD REFERENCE MATERIALS: HOMOGENEITY CHARACTERIZATION OF NBS SPECTROMETRIC STANDARDS IV. PREPARATION AND MICROPROBE CHARACTERIZATION OF W-20% MO ALLOY FABRICATED BY POWDER METALLURGICAL METHODS.
Special pub. (Final),
H. Yakowitz, R. E. Michaelis, and D. L. Vieth. Jan 69, 32p NBS-SP-260-16
Formerly Miscellaneous Publication series rept.

Descriptors: *Tungsten alloys, *Electron probes.
Identifiers: *Standard reference materials, *Tungsten alloy 20Mo.

This paper describes the preparation and evaluation of the first NBS standard tested specifically from the beginning for application to electron probe microanalyzers. The standard designated SRM 480 is a tungsten-20 weight percent molybdenum alloy prepared by a powder metallurgy process. Based on the results of about 1500 determinations for both tungsten and molybdenum by electron probe microanalysis, the material was found to be of high homogeneity at about the micrometer level molybdenum was 2.5% and that for tungsten 1.5%. Correction of relative intensity ratios to obtain concentrations is discussed in terms of input parameter uncertainties such as mass absorption coefficients, and electron backscatter factors. It is concluded that SRM 480 should be a valuable addition to any microprobe laboratory doing quantitative analyses.

COM-74-50495/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
USE OF MATRICES TO REPRESENT ELECTRON LENSES. MATRICES FOR THE TWO-TUBE ELECTROSTATIC LENS.
Final rept.,
D. DiChio, S. V. Natali, C. E. Kuyatt, and A. Galejs. Apr 74, 4p
Pub. in Review of Scientific Instruments, v45 n4 p566-569 Apr 74.

Descriptors: *Electron lenses, *Electrostatic lenses, *Matrices(Mathematics).

The use of matrices to represent electron lenses is discussed. It is shown that it is more convenient and natural to represent a lens by a matrix and that the matrix elements shoe s more regular behavior than do the focal properties. Thus matrices are more convenient to use in computer programs. Matrix elements for the two-tube electrostatic lens are presented and their properties discussed. A simple analytical form for the matrix elements of lenses with near-unity voltage ratios is given.

COM-74-50511/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TRACE ELEMENT DETERMINATION USING A HIGH YIELD ELECTROMAGNETIC ISOTOPE SEPARATOR AND NEUTRON ACTIVATION - THE DETERMINATION OF CADMIUM.
Final rept.,
H. L. Rook, P. D. LaFleur, and J. E. Suddueth. 1974, 8p
Pub. in Nuclear Instruments and Methods, v116 p579-586 1974.

Descriptors: *Neutron activation analysis, *Electromagnetic isotope separation, *Cadmium.

The use of isotope separators capable of producing high beam currents as applied to neutron activation analysis is discussed. The specificity of mass separation in this application allows beta or gross gamma counting to be used thereby providing increased sensitivity. The definition of instrument operational parameters and capabilities are discussed. Such parameters as yield, memory, resolution, overlap, and sputtering are considered. The optimized use of the mass separator as applied to the determination of cadmium is submicrogram quantities is presented.

COM-74-50519/9GA Not available NTIS
National Bureau of Standards, Washington, D.C.
FOCAL PROPERTIES OF THE TWO-TUBE ELECTROSTATIC LENS FOR LARGE AND NEAR-UNITY VOLTAGE RATIOS.
Final rept.,
D. DiChio, S. V. Natali, and C. E. Kuyatt. Apr 74, 7p
Pub. in Review of Scientific Instruments, v45 n4 p559-565 Apr 74.

Descriptors: *Electrostatic lenses, Focal length, Focusing, Voltage.

Accurate calculations of focal properties of the two-tube electrostatic lens are extended to cover a range of voltage ratios from 1.1 to 10000. The accuracy of the calculations is discussed in detail. For voltage ratios near 6400 the lens is found to be telescopic. Results are given in tabular form and as P-Q (object-image) curves. A simple analytical form for the focal properties of lenses with near-unity voltage ratios is given.

COM-74-50521/5GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C.
REPORT OF THE NATIONAL CONFERENCE ON WEIGHTS AND MEASURES (58TH) HELD IN MINNEAPOLIS, MINNESOTA, ON JULY 22-27, 1973.
Final rept.,
Sandra J. Wilson, and Richard N. Smith. May 74, 200p NBS-SP-391
Library of Congress Catalog Card no. 26-27766. See also report of 57th conference, COM-73-50521.
Paper copy available from GPO $2.50 as stock number 0303-01260 C13.10:391.

Descriptors: *Units of measurement, *Standards, *Meetings, Reporting, Weight measurement, Digital systems, Consumers, Packaging, Regulations, Law(Jurisprudence), Measuring instruments, Industries, Commerce, National government.

The report includes the proceedings (edited) of the 58th National Conference on Weights and Measures, held July 22-27, 1973, at the Radisson Hotel, Minneapolis, MN, and attended by state, county, and city weights and measures officials, the Federal Government, business, industry, and consumer organizations.

COM-74-50527/2GA Not available NTIS
National Bureau of Standards, Washington, D.C.
CALIBRATION OF PARAMAGNETIC THERMOMETERS USING SUPERCONDUCTIVE FIXED POINTS.
Final rept.,
R. J. Soulen, Jr. May 74, 3p
Pub. in Cryogenics, v14 n5 p250-252 May 74.

Descriptors: *Temperature measuring instruments, *Paramagnetic materials, Calibrating, Cerium compounds, Manganese compounds, Nitrates, Superconductivity.

A new method for calibration of paramagnetic materials is described. The technique consists of fitting the temperature-dependent mutual inductance of a coil set surrounding a paramagnetic material to a Curie Law using the superconductive transitions of several elements as thermometric fixed points. As a particular demonstration of this technique, the paramagnetic salt, cerous magnesium nitrate, was calibrated using the superconductive transitions of aluminum, zinc, and cadmium. The temperature scale obtained in this way was used in a study of the superconductive properties of iridium.

COM-74-50532/2GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Heat Div.
NBS CRYOGENIC THERMOMETRY AND THE PROPOSED CRYOGENIC EXTENSION OF THE IPTS.
Final rept.,
G. Cataland, R. P. Hudson, B. W. Bangum, H. Marshak, and H. H. Plumb. May 74, 35p NBS-TN-830
Library of Congress Catalog Card no. 74-600073.
Paper copy available from GPO $0.65 as C13.46:830.

Descriptors: *Temperature measuring instruments, *Cryogenics, Temperature measurement, Superconductors, Nuclear magnetic resonance, Josephson junctions, Performance evaluation.

Identifiers: Noise thermometers, Acoustical thermometers, International practical temperature scale, *Cryogenic thermometers.

The article outlines a comprehensive and long-term program being carried out by NBS scientists of the Cryogenic Physics and Temperature Sections. The goals of the program are the extension of IPTS 68 below 13.81 K and the development of devices which make practical realizations of that scale convenient and reliable. We propose to contribute to international adoption of a thermodynamically accurate scale below 13.81K by analyzing the results of three thermometers: the NBS Acoustical Thermometer (already in operation for several years), noise thermometry using the Josephson effect (recently developed), and gamma-ray anisotropy thermometry (recently studied in detail at NBS). Such a temperature scale will most likely be disseminated by the use of certain superconductors as thermometric reference points. Practical interpolation devices will be based on the principles of nuclear and electronic paramagnetism, nuclear quadrupole resonance, and nuclear magnetic resonance. Details of operation, measurement schemes and experimental progress made to date are included in nine appendices.

COM-74-50535/5GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Inst. for Basic Standards.
INTRODUCTION TO LIQUID FLOW METERING AND CALIBRATION OF LIQUID FLOWMETERS.
Final rept. FY 1973,
Lief O. Olsen. Jun 74, 61p NBS-TN-831
Library of Congress Catalog Card no. 74-600090.
Paper copy available from GPO $0.95 as C13.46:831.

Descriptors: *Liquid flow, *Flowmeters, *Calibrating, Incompressible flow, Measurement.

These notes are intended to serve as an instruction manual for technicians and engineers engaged in metering liquids and calibrating liquid flowmeters. It is a condensed review of the properties of liquids and the mathematical relations required in this work. References to more complete sources of properties of liquids, theoretical relations and instructions for metering liquids are included. Separate chapters discuss liquids and their properties as they affect flow, the theory of incompressible flow of liquids and the measurements required in the metering of liquids. One chapter describes several different apparatus and their use in the calibration of liquid flowmeters. The last chapter contains brief descriptions of the many types of flowmeters such as differential pressure, positive displacement, electromagnetic and ultrasonic. It also includes a discussion of the physical principles involved in their design and use.

COO-3218-2 PC$4.00/MF$1.45
Industrial Nucleonics Corp., Columbus, Ohio (Usa). New Ventures Div.
LABORATORY TESTING AND FIELD TEST SUPPORT OF THE SO SUB 2 STACK GAS MONITOR. FINAL REPORT, 1 JUNE 1971--31 DECEMBER 1973.
R. J. Pfeifer. 31 Dec 73, 33p
Contract AT(11-1)-3218

Descriptors: (*Sulfur oxides, *Monitoring), Fossil-fuel power plants, Stacks.

For abstract, see NSA 29 12, number 29419.

IPP-9-15 PC$5.75/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
CONSTRUCTION AND PERFORMANCE OF A MULTIPLE FOCUSING TIME OF FLIGHT MASS SPECTROMETER.
G. H. Oetjen, and W. P. Poschenrieder. Jan 74, 51p In German.

Descriptors: (*Time-of-flight spectrometers, Mass spectrometers), (*Mass spectrometers, *Performance), Comparative evaluations, Design, Mass resolution.

For abstract, see NSA 29 12, number 29609.

IS-T-593 PC$12.00/MF$1.45
Ames Lab., Iowa (Usa).
APPARATUS FOR THE DETERMINATION OF THE COMPRESSIBILITY AND RELATED PROPERTIES OF RARE EARTH SOLUTIONS AS A FUNCTION OF TEMPERATURE, PRESSURE, AND CONCENTRATION.
W. G. Manns. Apr 74, 177p
Contract W-7405-eng-82

Descriptors: (*Solutions, *Compressibility), Chlorides, Data processing, Digital computers, Measuring instruments, Rare earth compounds, Temperature dependence.

For abstract, see NSA 29 12, number 31653.

JUL-1007-RX PC$4.25/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Zentralinstitut fuer Reaktorexperimente.
VERSATILE GAS-ANALYSIS FACILITY FOR TECHNOLOGICAL USE.
E. Jeltsch, and W. Graf. Oct 73, 23p
In German.

Descriptors: (*Electron-capture detectors, *Operation), Design, Gas analysis, Gas chromatography, Mass spectrometers, Mass spectroscopy, Performance.

For abstract, see NSA 29 12, number 29553.

KHFTI-73-27 PC$5.00/MF$1.45
An Ukrainskoj SSR, Kharkov. Fiziko-Tekhnicheskij Inst.
DEVELOPMENT OF EQUIPMENT FOR THE MAGNETIC FIELD MEASUREMENT OF THE ELECTROMAGNETIC ANALYZERS.
E. M. Grishchenko. 1973, 39p
In Russian.

Descriptors: (*Magnetic analyzers, *Magnetic fields), (*Magnetometers, *Design), Electronic circuits.

For abstract, see NSA 29 12, number 29610.

NIM-1582 PC$4.25/MF$1.45
National Inst. For Metallurgy, Johannesburg (South Africa).
CONSTRUCTION AND TESTING OF A PRECISION CALORIMETER.
K. Lowe, A. W. Forbes, and F. Marsicano. 24 Oct 73, 23p

Descriptors: (*Calorimeters, *Design), Construction, Performance testing.

For abstract, see NSA 29 12, number 31655.

PAT-APPL-420 977 PC$4.25/MF$1.45
Department of Health, Education, and Welfare. Bethesda, Md. Patent Branch.
RADIOGRAPHIC TEST STAND.
Patent Application,
T. J. Morgan. Filed 3 Dec 73, 23p
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *X ray apparatus, *Alignment, *Patent applications, Radiography.

The patent application describes a test stand for maintaining fixed geometry during X-ray imaging. It comprises a slide aperture for beam definition; a slide assembly having a wire grid for image sizing; and magnetic tape which secures metal strips for marking the edge of the light field relative to an X-ray field during imaging. The image is recorded on Linographic paper carried by the slide assembly.

PATENT-3 766 639 Not available NTIS
Department of the Air Force Washington D C
METHOD FOR TESTING ELECTRONIC CIRCUITS USING VARIABLE LIQUID DIELECTRIC CONSTANT TESTING MEDIA.
Patent,
Frank R. Parr, and Dale M. Weaver. Filed 20 Jan 72, patented 23 Oct 73, 3p Rept nos. PAT-APPL-219 578,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Test equipment, *Patents, Silicones, Tuned circuits, Dielectrics, Liquids, Test methods, Dielectric properties, Constants.
Identifiers: PAT-CL-29-593, Chloroethanes.

The patent relates to the combining of chlorothene with dimethyl silicone fluid to provide a means and the method of testing frequency tuned electronic circuits, to be packaged in a solid resin, under simulated operating conditions.

PB-232 754/2GA PC$3.25/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
EVALUATION OF PORTABLE, DIRECT-READING NO2 METERS.
Final rept.,
Bruce A. Johnson. Apr 74, 34p* NIOSH-TR-210-74, DHEW/NIOSH-74-108

Descriptors: *Gas detectors, *Nitrogen dioxide, Operation, Tests, Performance evaluation, Portable equipment, Accuracy.
Identifiers: *Air pollution detection.

This report discusses testing of portable, direct-reading NO2 meters to evaluate their performance and to discover which instruments are best suited for use by the National Institute for Occupational Safety and Health and the Occupational Safety and Health Administration. The purpose of the testing was to determine performance capabilities and limitations so that realistic performance standards can be established. Four instruments were evaluated in this report.

PB-232 755/9GA PC$3.75/MF$1.45
National Inst. for Occupational Safety and Health, Cincinnati, Ohio.
EVALUATION OF PORTABLE, DIRECT-READING COMBUSTIBLE GAS METERS.
Final rept.,
Charles S. McCammon, Jr. Apr 74, 57p* NIOSH-TR-209-74, DHEW/NIOSH-74-107

Descriptors: *Gas detectors, *Flammable gases, Portable equipment, Stability, Calibration, Humidity, Performance evaluation, Hexanes, Benzene, Methane, Tests, Performance standards.

The National Institute for Occupational Safety and Health tested portable instruments designed to measure combustible gases for twenty specific design and performance characteristics. Nine totally portable combustible gas meters were tested. From results of tests, realistic performance specifications are recommended for two classes of combustible gas meters. These specifications will be used as the basis for future NIOSH certification regulations for combustible gas meters.

PB-232 909/2GA PC$5.25/MF$1.45
Council for Scientific and Industrial Research, Pretoria (South Africa). Chemical Engineering Group.
FLOW PATTERNS UPSTREAM OF ISOKINETIC DUST SAMPLING PROBES.
Special rept.,
E. E. A. Rouillard, and P. J. Valvona. Feb 74, 42p
CSIR-SR-CENG-019, ISBN-0-7988-0495-5

Descriptors: *Gas flow, *Dust, *Samplers, Hot wire anemometers, Streamlining, South Africa.
Identifiers: *Isokinetic samplers.

According to the principle of isokineticity the flow pattern upstream of a probe through which gas is sampled at the main stream velocity should not be affected by the presence of the probe. However, local velocity measurements taken in a wind tunnel with a hot wire anemometer show that some probes do seriously affect the gas streamlines. The degree to which the streamlines are affected depends on the wall thickness and chamfer of the nozzle, the stem diameter as well as on the size and proximity of sampling accessories in the vicinity of the nozzle. Tests showed that for a probe to cause negligible disturbance under isokinetic conditions it should have a sharp-edged nozzle with little or no outside chamfer, and the stem of the probe should be at least 11 diameters downstream from the nozzle inlet. Recommendations are made for the design and operation of dust sampling probes which will ensure optimum sampling accuracy.

RD/B/N-2854 PC$5.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
ON-LINE PDP-11 ACOUSTIC EMISSION LOCATION ANALYSIS FOR A SYSTEM OF 3 TRANSDUCERS.
A. Tobias. Dec 73, 36p

Descriptors: (*Pressure vessels, Acoustic emission testing), (*Acoustic emission testing, *Data acquisition systems), Data processing, Defects, Noise, On-line measurement systems, Pdp computers, Transducers.

For abstract, see NSA 29 12, number 29254.

RFP-2060 PC$6.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.; California Univ., Livermore (Usa). Lawrence Livermore Lab.
NONDESTRUCTIVE EVALUATION CONCEPTS APPLIED TO INDUSTRIAL USE OF ACOUSTIC EMISSION.
T. F. Drouillard, R. G. Liptai, and C. A. Tatro. 28 Jan 74, 60p CONF-740117-1

Descriptors: (*Acoustic emission testing, *Reviews), (*Pressure vessels, Acoustic emission testing).

For abstract, see NSA 29 12, number 29255.

SLA-74-84 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
NEW 185-FOOT TOWER VERTICAL DROP CAPABILITY.
J. L. Cawlfield. Mar 74, 27p
Contract AT(29-1)-789

Descriptors: (*Mechanical tests, *Performance testing), (*Mechanical structures, *Design), Destructive testing, Energy transfer, Impact shock, Impact strength, Mechanical vibrations, Operation.

For abstract, see NSA 29 12, number 31662.

UCID-15789 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SURVEY AND REVIEW OF LASER PULSE CALORIMETERS.
P. A. Schultz. 18 Jan 71, 15p

Descriptors: (*Calorimeters, *Reviews), (*Lasers, *Calibration), Laser radiation.

For abstract, see NSA 29 12, number 29613.

14C. Recording Devices

PATENT-3 809 467 Not available NTIS
Department of the Interior, Washington, D.C.
AUDIO-VISUAL PRESENTATION SYSTEM.
Patent,
Leland W. Sprinkle. Filed 14 Jun 72, patented 7 May 74, 12p PAT-APPL-262 803, DOCKET/SUR-1320, DOCKET/SUR-1321
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Still projectors, *Tape recorders, *Patents, Visual aids, Synchronism.
Identifiers: PAT-CL-353-15, *Audio visual systems.

The patent describes an improved combined audio-visual presentation system. The improvement affords a more reliable matching of the sequences in which individual visual showings are presented for viewing and stereo audio messages related to such showings are delivered. A closely integrated control applied to the interactions between audio and visual components of the system in the present invention allows repeated presentations of complete programs without the use of ancillary tape-projector synchronizing or adjusting equipment.

14D. Reliability

AD-779 938/0GA PC$4.00/MF$1.45
Florida State Univ Tallahassee Dept of Statistics
RECENT RESEARCH ON CLASSES OF LIFE DISTRIBUTIONS USEFUL IN MAINTENANCE MODELLING.
Interim technical rept.,
Frank Proschan. Apr 74, 20p Rept nos. FSU-Statistics-M291, TR-26 AFOSR-TR-74-0792
Grant AF-AFOSR-2581-74

Descriptors: *Reliability, *Maintenance, *Replacement theory, Life tests, Distribution functions, Stochastic processes, Mathematical models.
Identifiers: Statistical inference, Failure rate functions.

Several physically motivated broad classes of life distributions have been introduced recently and shown to be natural and useful in the study of maintenance policies, such as age replacement, block replacement, and replacement at failure only. These classes include the 'new better than used' class, the 'new better than used in expectation' class, and their duals. Recent papers studying these classes are surveyed, and results are summarized concerning the following: (a) replacement policy comparisons, (b) models giving rise to these classes, (c) preservation of classes under standard reliability operations, (d) bounds on reliability and mean life for both individual components and systems, and (e) statistical inference for these classes. Additional classes of life distributions such as the 'decreasing mean residual life' class, the 'decreasing percentile residual life' class, and their duals are briefly discussed. Inclusion relationships among all of these classes and reliability classes studied earlier are exhibited. (Modified author abstract)

AD-780 406/5GA PC$9.00/MF$1.45
Assistant Secretary of Defense (Installations and Logistics) Washington D C
DOD QUALITY ASSURANCE PROGRAM REVIEW. PHASE I REPORT.
Apr 74, 118p

Descriptors: *Department of Defense, *Quality assurance, Management information systems, Management planning and control, Quality control, Contracts, Life cycles, Bibliographies.
Identifiers: *Contract administration.

In June 1973, the DoD Quality Assurance Council directed that a DoD Quality Assurance Program Review be conducted to assess the status of Quality Assurance (QA) throughout the entire DoD. The study was to comprise three elements: Background Review, Main Study, and Actions on Future QA. A Study Plan and Ad Hoc DoD Work Panel was approved by the Council. The Study Plan included five phases as follows: Background review, acquisition, functional issues, personnel issues, and organizational issues. The original approved plan for the subject study is included in Appendix A. This report represents the results of the Work Panel's effort on Phase I.

KFK-1811 PC$19.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Angewandte Systemtechnik und Reaktorphysik.
INTRODUCTION TO METHODS AND PROBLEMS OF RELIABILITY.
G. Weber. Jan 74, 322p
In German and English.

Descriptors: Diagrams, Equations, Reliability.

For abstract, see NSA 29 12, number 31654.

14E. Reprography

AD-780 087/3GA PC$3.00/MF$1.45
Defense Intelligence Agency Washington D C
MICROFICHE STANDARDS AND RESPONSIBILITIES.
27 Mar 74, 18p Rept no. DIAR-59-3

Descriptors: *Microfiche, *Standards, Classification, Military intelligence.

The report establishes standards for microfiche copies of intelligence documents and indicies, coordinates microfiche production and facilitates microfiche exchanges. (Author)

E74-10509 PC$4.00/MF$1.45
Colorado School of Mines, Golden. Dept. of Geology.
NEW USES OF SHADOW ENHANCEMENT,
Keenan Lee, and Don L. Sawatzky. 27 Mar 74, 20p Remote Sensing-74-5 NASA-CR-138232
Contract NAS9-13394, Grant NGL-06-001-015
Presented at the Annual Remote Sensing of Earth Resources Conference (3rd), University of Tennessee Space Inst., 25 Mar 74.
Original contains imagery. Original photography may be purchased from the EROS Data Center, 10th and Dakota Ave., Sioux Falls, S.D. 57198.

Descriptors: Structural properties(Geology), Photointerpretation, Multispectral photography, Image enhancement, Shadows, Colorado, Skylab program, EREP, Topography, Surface properties, Tectonics.

The author has identified the following significant results. Shadow enhancement of topographic linears in photographic or scanner images is a valuable tool for interpretation of geologic structures. Whether linears will be enhanced or subdued depends on sun angle and azimuth. The relationship of the sun's attitude to topographic slopes determines which trends are available for interpretation in existing imagery, and it can be used to select the time of day, surface properties, and film and filter characteristics in planning aircraft flights or satellite orbital passes. The technique of selective shadow enhancement can be applied to all photographic or imaging experiments, but its best for snow-covered scenes, side-looking radar images, and painted relief models.

LA-UR-74-500 PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
COMPUTER GENERATED MOVIES: ANOTHER DIMENSION IN MAN-MACHINE COMMUNICATIONS.
R. L. Elliott, S. R. Orr, and E. C. Pequette. 3p
CONF-740512-1

Descriptors: Cdc computers, Communications, Computer calculations, Computers, Hydrodynamics, Images, Los alamos scientific lab, Personnel, Photography, Visible radiation.

For abstract, see NSA 29 12, number 31604.

PATENT-3 778 267 Not available NTIS
Department of the Air Force Washington D C
PHOTOGRAPHIC DEVELOPER.
Patent,
Simeon Braunstein. Filed 14 Oct 71, patented 11 Dec 73, 3p Rept nos. PAT-APPL-189 327,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, Glycine, Nitrogen heterocyclic compounds, Photographic chemicals, Sensitivity, Photographic film.
Identifiers: *Photographic developers, PAT-CL-96-66-HD, Glycine/N-hydroxyphenyl, Pyrazolidinone/phenyl, Pyrazolidones.

The patent describes a photographic developer for achieving maximum film sensitivity by increasing the dynamic range of a photographic film. It includes an additive mixture of N-(p-hydroxyphenyl glycin) and 1-phenyl-3-pyrazolidone.

UCID-16460 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
INFORMATION RECOVERY FROM HIGH-SPEED SILVER HALIDE EMULSIONS CONTAINING CRT TRACES AFTER EXPOSURE TO NUCLEAR GAMMA RADIATION.
C. H. Dittmore. 5 Mar 74, 19p
Contract W-7405-eng-48

Descriptors: (*Photographic emulsions, *Physical radiation effects), Cathode ray tubes, Gamma radiation, Nuclear explosions, Transients.

For abstract, see NSA 29 12, number 29561.

15. MILITARY SCIENCES

15A. Antisubmarine Warfare

AD-780 447/9GA PC$7.25/MF$1.45
Stanford Research Inst Menlo Park Calif Naval Warfare Research Center
MARKOV MODELS AND DYNAMIC ANALYSIS OF ASW EFFECTIVENESS.
Technical rept.,
William H. Frye, and Andrew J. Korsak. Jul 73, 304p Rept no. NWRC-TR-7
Contract N00014-71-C-0417

Descriptors: *Antisubmarine warfare, Mathematical models, Stochastic processes, Queueing theory, Approximation, Monte Carlo method, Estimates, Quadratic programming.
Identifiers: *Markov chains, Parameter estimation, SemiMarkov processes.

The report presents methodology for evaluating ASW system effectiveness in dynamic operational contexts. It shows that conditional probability models may be generalized by using Markov modeling methods and suggests three models that include false contacts. Parameter estimation methods are given for Markov models and the results of experimentation with several methods are presented. Some of the methods use operational data not currently used in effectiveness modeling; hence, it is suggested that improved effectiveness modeling may be possible with Markov methods because more data can be used to

estimate model parameters. State space structuring is investigated and results of numerical experimentation are given for different sets of states applied to the same set of data. (Data were generated by hypothetical non-Markov dynamic processes and a Monte Carlo simulation model). (Modified author abstract)

15B. Chemical, Biological, and Radiological Warfare

AD-779 790/5GA PC$5.25/MF$1.45
Rand Corp Santa Monica Calif
AN EVALUATION OF CHEMICAL CROP DESTRUCTION IN VIETNAM,
Russell Betts, and Frank Denton. Oct 67, 41p Rept no. RM-5446-ISA/ARPA
Contracts DAHC15-67-C-0158, DAHC15-67-C-0143

Descriptors: *Herbicides, *Vietnam, *Army operations, *Chemical warfare, Food, Sprays, Agriculture, Damage assessment, Attitudes(Psychology), Cost effectiveness, Interviewing, Correlation techniques.
Identifiers: *Crop destruction program.

The memorandum reports on an attempt to evaluate the utility of chemical crop destruction operations in Vietnam. The evaluation is limited to two aspects of the question of overall utility: (1) The effectiveness of chemical crop destruction as a means of denying food to the VC; and (2) the cost of the operations in terms of increasing the hostility of the non-VC, rural population toward the US/GVN. Because the direct denial of food seems to be a primary reason for the crop spraying program, this analysis is limited to that one aspect of effectiveness.

AD-779 791/3GA PC$5.25/MF$1.45
Rand Corp Santa Monica Calif
A STATISTICAL ANALYSIS OF THE U.S. CROP SPRAYING PROGRAM IN SOUTH VIETNAM,
Anthony J. Russo. Oct 67, 45p Rept no. RM-5450-ISA/ARPA
Contracts DAHC15-67-C-0158, DAHC15-67-C-0143

Descriptors: *Chemical warfare, *Vietnam, *Herbicides, *Army operations, Losses, Statistical analysis, Agriculture, Economics, Variations, Damage assessment, Enemy personnel, Cost effectiveness, Civilian population, Rations, Food.
Identifiers: Rice, Food consumption, *Crop destruction program.

The memorandum aims at an improved understanding of the effects of crop spraying operations on Viet Cong rice consumption, by examination of relevant statistical indicators. Regional averages of individual VC daily rice rations were used as an indicator of the pattern of VC rice consumption; the variation in rice rations from region to region was examined, using multiple regression techniques, in the context of variations in other regional characteristics including the percentage of regional rice lands sprayed with herbicides.

AD-779 792/1GA PC$4.75/MF$1.45
Military Assistance Command Vietnam Apo San Francisco 96243
EVALUATION OF HERBICIDE OPERATIONS IN THE REPUBLIC OF VIETNAM AS OF 30 APRIL 1966.
12 Jul 66, 31p
This report is less than 50% legible.

Descriptors: *Herbicides, *Chemical warfare, *Army operations, *Vietnam, Food, Agriculture, Defoliation, Sprays, Damage assessment, Economics, Vegetation, Civilian personnel, Enemy personnel.
Identifiers: Crop destruction program.

The purpose of the study is to determine and evaluate the benefits and detriments accruing to the Allied Forces from herbicide operations conducted in the Republic of Vietnam (RVN). The study focuses on conditions that exist among the enemy and the civilian population which are attributable, at least in part, to the employment of herbicides in RVN. Portions of this document are not fully legible.

AD-779 793/9GA PC$4.00/MF$1.45
Military Assistance Command Vietnam Apo San Francisco 96222
MILITARY OPERATIONS: HERBICIDE OPERATIONS(U).
12 Aug 69, 20p Rept no. MACV Dir-525-1

Descriptors: *Herbicides, *Chemical warfare, *Army operations, *Vietnam, Policies, Defoliation, Sprays, Damage, Agriculture, Food.
Identifiers: *Crop destruction program.

The directive prescribes policies, responsibilities, and procedures governing the operational employment of herbicides with the United States Military Assistance Command. The intent of the directive is to insure that the herbicide program in the Republic of Vietnam (RVN) is conducted in accordance with the provisions of the Report on the Herbicide Policy Review, American Embassy, Saigon, 28 August 1968.

AD-779 794/7GA PC$10.00/MF$1.45
Military Assistance Command Vietnam Apo San Francisco 96243
THE HERBICIDE POLICY REVIEW.
Rept. for Mar-May 1968.
20 Aug 68, 140p
This report is less than 50% legible.

Descriptors: *Herbicides, *Chemical warfare, *Army operations, *Vietnam, Reviews, Policies, Defoliation, Agriculture, Damage, Psychology, Ecology, Cost analysis, Toxicity, Hazards.
Identifiers: *Crop destruction program.

The herbicide policy review was part of continuing efforts to assess the efficacy of herbicide programs in terms of military benefits to the Allied Forces, South Vietnamese, and American, as well as those of the other Free World nations; as compared to economic costs and possible ecological effects. Additionally, the Committee was charged with examining current procedures and techniques employed in implementing the programs with a view to possible recommendations for changes and improvements that would help maximize the benefits and minimize the costs and ecological effects. The Committee conducted the review during the period March - May, 1968. Portions of the document are not fully legible.

AD-779 795/4GA PC$5.75/MF$1.45
Military Assistance Command Vietnam Apo San Francisco 96243
EVALUATION OF HERBICIDE OPERATIONS IN THE REPUBLIC OF VIETNAM (SEPTEMBER 1962-SEPTEMBER 1963),
Peter G. Olenchuk, Robert T. Burke, Oran K. Henderson, and Wayne E. Davis. 10 Oct 63, 55p
This report is less than 50% legible.

Descriptors: *Herbicides, *Chemical warfare, *Army operations, *Vietnam, Defoliation, Visibility, Sprays, Agriculture, Civil affairs, Psychological operations, Policies, Food, Surveys.
Identifiers: *Crop destruction program.

The report is a review and assessment of evaluation reports, methodology, observations, and policies on the use of herbicides for the destruction of crops and vegetation in Vietnam. Portions of this document are not fully legible.

AD-779 796/2GA PC$8.00/MF$1.45
Pacific Air Forces Apo San Francisco 96553 Checo Div
HERBICIDE OPERATIONS IN SOUTHEAST ASIA, JULY 1961-JUNE 1967,
Charles V. Collins. 11 Oct 67, 100p Rept no. DTEC-67-0020

Descriptors: *Herbicides, *Chemical warfare, *Army operations, *Southeast Asia, Defoliation, Sprays, Visibility, Agriculture, Food, Morale, Rations, Enemy personnel, Civilian personnel, Vietnam, Laos.
Identifiers: CHECO project, Crop destruction program.

The following topics are discussed: Early operational history; expanded herbicide operations; current concept of operations; and results and effects.

AD-779 797/0GA PC$6.50/MF$1.45
Scientific Advisory Group (Navy) Fpo San Francisco 96610
A REVIEW OF THE HERBICIDE PROGRAM IN SOUTH VIETNAM,
William F. Warren. Aug 68, 69p Rept no. Working Paper-10-68

Descriptors: *Herbicides, *Chemical warfare, *Army operations, *Vietnam, History, Reviews, Defoliation, Test methods, Sprays, Ecology, Vegetation, Visibility, Psychology, Damage assessment, Civilian personnel, Enemy personnel.
Identifiers: *Crop destruction program.

The review includes a history and early development of the use of herbicides in modern warfare. Also included in the report is: A summary of herbicide test and evaluation programs; current operations; defoliation aircraft attrition; assessment of psychological effects of the crop destruction program; and results of herbicide operations in Vietnam.

AD-779 798/8GA PC$5.25/MF$1.45
Scientific Advisory Group (Navy) Fpo San Francisco 96610
CROP DESTRUCTION OPERATIONS IN RVN DURING CY 1967,
William F. Warren, Lehman L. Henry, and Richard D. Johnston. 23 Dec 67, 42p Rept no. Working Paper-20-67

Descriptors: *Herbicides, *Chemical warfare, *Army operations, *Vietnam, Food, Sprays, Damage, Morale, Statistical analysis, Defoliation, Civilian personnel, Enemy personnel, Losses.
Identifiers: *Crop destruction program.

Contents:
- Objectives and policies of the crop destruction program;
- Analysis of crop destruction operations relative to objectives;
- Comments on effectiveness of operations;
- (Effect on VC/NVA food supply, relationship of crop destruction operations to VC/NVA food shortages, effects of crop destruction missions in coastal provinces, effects of crop destruction missions in highland areas, food production requirements of the VC/NVA, effects on VC/NVA morale, effect on civilians in VC controlled areas).

15C. Defense

AD-779 932/3GA PC$3.00/MF$1.45
Informatics Inc Rockville Md
SOVIET VIEW OF LASER WEAPONS.
Interim rept.,
Stuart G. Hibben. 26 Apr 74, 10p AFOSR-TR-74-0865
Contract F44620-72-C-0053, ARPA Order-1622

Descriptors: *Laser weapons, *USSR, Tactical warfare, Carbon dioxide lasers.

The report is a translated excerpt of a recent article on laser weapons appearing in the Soviet military journal Tekhnika i vooruzheniye (Engineering and Armament). The treatment is general, and claims to be based on non-Soviet technology.

AD-779 996/8GA PC$4.75/MF$1.45
Army War Coll Carlisle Barracks Pa
CAN NATIONAL GUARD DIVISIONS ATTAIN AND MAINTAIN A READINESS POSTURE TO PERMIT EARLY DEPLOYMENT.
Student essay,
George E. Thayer. 22 Oct 73, 33p

Descriptors: *Military reserves, *Readiness, Deployment, Mobilization, Army personnel.
Identifiers: National Guard.

The essay addresses the difficulties associated with reduced mobilization training time and early deployment of Reserve Component elements, specifically the Army National Guard of the United States. (Modified author abstract)

AD-780 006/3GA PC$4.25/MF$1.45
Army War Coll Carlisle Barracks Pa
TOWARD A MORE READY RESERVE.
Student essay,
Michael N. Zabych. 19 Oct 73, 24p

Descriptors: *Military reserves, *Army training, Efficiency, Equipment, Mobilization, National defense, Combat readiness.

During a national emergency, the US will require rapid mobilization of the Reserve forces to augment the strength of the active Army. Reduced strength of all Army components during the past four years has resulted in a diminished war deterrence capability by ground forces. The trend has occurred during a period when principle adversaries have modernized, improved, and increased their war-making potential. The nation's leaders must take measures to improve defense posture by maintaining an effective active Army that is supported by a truly ready reserve, a reserve that can be mobilized quickly and possesses the trained personnel necessary for any contingency mission. This essay is intended to uncover deficiencies at the 'grassroots' level of the Army Reserve and recommend positive courses of action for improved reserve readiness. (Author)

AD-780 114/5GA PC$4.50/MF$1.45
Human Sciences Research Inc Mclean Va
CRISIS RELOCATION: DISTRIBUTING RELOCATED POPULATIONS AND MAINTAINING ORGANIZATIONAL VIABILITY.
Final rept. 28 Mar 72-30 Apr 74,
William G. Gay, and William W. Chenault. Apr 74, 118p Rept no. HSR-RR-72/2-Se
Contract DAHC20-73-C-0340

Descriptors: *Civil defense, *Emergencies, *Evacuation, Readiness, Shelters, Housing(Dwellings), Planning, Sociology, Economics, Population, Distribution, Organizations, Task forces.

The report examines alternative means for determining the hosting capacities of communities which might receive additional population during a crisis relocation. The indicators which are considered include fallout and basement spaces available, per capita retail trade, housing quality, and poverty levels. The study concludes that hosting capacity should be based on the organizational capacity of communities both to support additional population (by distributing essential goods and services) and to organize and utilize relocated workers. The report emphasizes the need for maintaining organizational continuity and the organizational affiliations of government, production, and service workers through a crisis. It suggests further exploration of disaster-response and crisis relocation strategies which focus on the role of existing organizations in communicating and implementing preparedness concepts. (Modified author abstract)

15E. Logistics

AD-780 022/0GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
CRAMPON FOR USE IN WORLDWIDE MOUNTAIN OPERATIONS.
Final memo.,
Norman P. Leibel. Apr 74, 7p Rept no. LWL-TM-74-09

Descriptors: *Field equipment, Reliability, Climbing, Mountains, Ice, Environments.
Identifiers: *Crampons, Boots(Footwear).

The crampon, developed by the US Army Land Warfare Laboratory, was designed to fit a range of ski and vapor barrier boots used by the US Army. The crampon is lightweight, durable and provides the user with required foot stability to safely cross ice fields. The feasibility of designing and fabricating an adjustable crampon has demonstrated. (Modified author abstract)

AD-780 023/8GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
LWL GRIDS FOR PRODUCT IMPROVEMENT TEST OF LWL FUEL TABLET.
Technical memo. 5 Jun-7 Sep 73,
Frederick M. Drake. Apr 74, 7p Rept no. LWL-TM-74-12

Descriptors: *Field equipment, *Fuels, *Grids, Reliability, Safety, Heating, Military rations.

The US Army Land Warfare Laboratory (LWL) developed an experimental heat tablet of acetal resin for heating combat rations. To use this new fuel source efficiently and provide a support for the ration can or canteen to be heated, the LWL grid was developed. Field evaluations of the grid were generally favorable, although some comments by the users indicated the standoff height of one inch was too much. A decision was made to modify the grid and reduce the standoff height from one inch to one quarter inch. The report describes the modified LWL grid. More detailed background is available in Technical Memorandum No. 71-02, 'Improved Ration Heater and Fuel Tablet'. (Modified author abstract)

AD-780 024/6GA PC$3.25/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
ROPE KIT, SPECIAL PURPOSE MOUNTAINEERING AND RIVER CROSSING.
Final rept.,
Joseph L. Carney. Apr 74, 29p Rept no. LWL-TR-74-44

Descriptors: *Field equipment, *Rope, Crossings, Reliability, Safety, Test methods, Rivers.

A River Crossing Rope Kit was developed. The specially fabricated ropes had a multifilament polypropylene core with a braided nylon cover and would float on water. Evaluation results are included in the report. (Modified author abstract)

AD-780 025/3GA PC$3.00/MF$1.45
Army Land Warfare Lab Aberdeen Proving Ground Md
MODIFIED GRAPNEL WITH LINE.
Final rept.,
John D. Buchanan. Mar 74, 11p Rept no. LWL-TR-74-49

Descriptors: *Line throwing equipment, *Grapnels, *Rocket launching, Reliability, Safety, Rope, Test methods, Grenade launchers, Rocket launchers, Rescue equipment, Army operations.

A lightweight, compact, individually operated grapnel system is needed to provide U.S. Forces with a device to facilitate the movement of personnel across streams, walls, ravines, canyons, cliffs and mountainous areas during patrols, raids and rescue operations. This rocket propelled grapnel system has a range of 175 to 225 ft horizontally and 140 to 165 ft vertically. To facilitate carrying, the grapnel system is divided into two bandoleer assemblies, the line bandoleer and the grapnel bandoleer. The report covers the modifications made to meet deficiencies and short-comings which appeared during ET/ST and modifications made to fire the system from the M-203 Grenade Launcher.

AD-780 508/8GA PC$6.75/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
SYNOPSIS OF BACKGROUND MATERIAL FOR MIL-STD-210B, CLIMATIC EXTREMES FOR MILITARY EQUIPMENT.
Air Force surveys in geophysics,
Norman Sissenwine, and Rene V. Cormier. 24 Jan 74, 276p Rept nos. AFCRL-AFSIG-280, AFCRL-TR-74-0052
See also PB-121 741.

Descriptors: *Military equipment, *Climate, Military requirements, Standards, Environmental tests, Atmospheric temperature, Humidity, Wind velocity, Atmospheric precipitation, Barometric pressure, Atmospheric density, Ozone, Sand, Dust, Ocean surface, Temperature, Ocean waves, Salinity, Cosmic rays, X rays, Ultraviolet radiation.

The Design Climatology Branch of the Air Force Cambridge Research Laboratories had the scientific responsibility for leading a DoD Task Group effort to revise MIL-STD-210A 'Climatic Extremes for Military Equipment'. This document represents the fruition of the goals of the task group. It relates the background studies supporting the values in MIL-STD-210B, so that MIL-STD-210B users need to consult only this single document for an elaboration on the MIL-STD-210B extremes. In addition, the report contains informationn on the origin, necessity for and the events leading to a revision of MIL-STD-210A. Discussions of the major changes in the Standard's philosophy and its contents are also provided.

AD-780 518/7GA PC$3.75/MF$1.45
Naval Ammunition Depot Crane Ind
FOAM OVER AIR INFLATABLE STRUCTURE FEASIBILITY STUDY.
Final rept. 23 Apr-30 Jul 73,
Alvin Smith, and Larry E. Craig. Apr 74, 70p Rept no. NAD-CR-CR-RDTR-262 AFCEC-TR-74-1

Descriptors: *Inflatable structures, *Molds(Forms), Expanded plastics, *Molding techniques, Foam, Polyurethane resins, Protective coatings, Construction materials, Feasibility studies.
Identifiers: *Construction forms.

A study has been conducted to determine the feasibility and practicality of using dual-wall air inflatable sections as forms upon which can be constructed and fabricated a rigid foam shell that will be self-supporting and capable of withstanding certain conditions of environmental stress such as wind and snow loading. The study also provided for the acquisition and compilation of data regarding equipment, tools, materials, mold releases, protective coatings and structural design. These data were compiled from laboratory studies, literature from industry, personal interviews and practical experience in applying rigid foams in various situations. (Author)

AD-780 524/5GA PC$3.00/MF$1.45
Air Force Flight Test Center Edwards AFB Calif
AIR FORCE FLIGHT TEST CENTER TECHNOLOGY NEEDS.
Annual rept. (Final) CY 1973,

James L. Stehn. May 74, 23p Rept no. AFFTC-TD-74.1

Descriptors: *Air Force Systems Command, *Military requirements, Aerial targets, Flight crews, Stations, Human factors engineering, Fire control system components, Gunnery.
Identifiers: *Technology needs.

This technology document presents all of the 1973 technology needs of the Air Force Flight Test Center in accordance with the definitions and requirements of AFSCR 80-29, Technology Need Program. Laboratory responses to the statements of need are also included. The Technology Needs are: a full size maneuvering target aircraft; engineering anthropometric and biomedical evaluation of aircraft crew station geometries; vector missile miss distance indicator (to be installed in targets); automatic scoring system for air-to-air and air-to-ground gunnery; and an automatic bomb scoring system. (Author)

15F. Nuclear Warfare

AD-779 935/6GA PC$3.75/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
USE OF OPTIMA FOR SOLVING GAMES.
Final rept. 1 Sep 73-1 Dec 73,
Karl T. Benson. Apr 74, 52p Rept no. AFWL-TR-74-18

Descriptors: *Game theory, *Nuclear warfare, *Strategy, *Optimization, Linear programming, Inequalities, Algorithms.
Identifiers: CDC 6600 computers, Two person games, Zero sum games, Matrix games, OPTIMA computer program.

Recent uses of a two-person, zero-sum game formulation for analysis within the Air Force Weapons Laboratory have resulted in a need to document the methodology and mechanics of solving games for their optimal strategies. The report describes the game formulation, the conversion of the game problem to an equivalent linear programming problem, the formulation of input for computer solution of this linear programming problem, and the location of the answers in the output. The software system used for the computations required to solve these mathematical programming problems on a CDC 6600 computer is called OPTIMA. All phases of the solution procedure are illustrated with appropriate examples. (Author)

15G. Operations, Strategy, and Tactics

AD-779 848/1GA PC$4.00/MF$1.45
Institute for Defense Analyses Arlington Va Program Analysis Div
AN EXAMINATION OF THE PARSONS AND HULSE PAPERS ON RATES OF ADVANCE.
Final rept.,
Leonard Wainstein. Dec 73, 92p Rept no. P-991
IDA/HQ-73-15766
Contract DAHC15-73-C-0200

Descriptors: *Army operations, *Infantry, *Force level, *Warfare, Adverse conditions, Close support, Area denial, Battles, Enemy personnel, History.
Identifiers: *Rates of advance, World War 2.

An analysis is made of two seminal documents, both written in 1954, which have formed the presumed basis for rates of advance curves used in simulation. The Parsons and Hulse papers are examined in terms of their character and content and primarily to examine their sources in order to see to what degree the papers reflected the historical record they claimed to have used. It became apparent that the papers were published as hasty, rough drafts, inputs to a larger study, and that their contents have been grossly exaggerated in the succeeding years by model builders. The numerous specified and unspecified qualifications surrounding the data have been overlooked in the transformation of the original data. Only part of the data the authors presented is historically verifiable from the now-existing records. (Author)

AD-779 850/7GA PC$3.75/MF$1.45
Institute for Defense Analyses Arlington Va Program Analysis Div
SOME ALLIED AND GERMAN CASUALTY RATES IN THE EUROPEAN THEATER OF OPERATIONS.
Final rept.,
Leonard Wainstein. Dec 73, 67p Rept no. P-989
IDA/HQ-73-15764
Contract DAHC15-73-C-0200

Descriptors: *Army operations, *Warfare, *Casualties, Europe, Military forces(Foreign), Military forces(United States), Germany(East and West), Battles, Enemy personnel, History.
Identifiers: Germany(Before partition), World War 2.

Historical research is aimed at gaining some new insights into relationships which might exist among the key simulation elements of force ratios, casualties, and rates of advance. This paper has two objectives. It examines U.S. and German casualties and casualty rates in the European Theater in 1944-45 with prime emphasis on the Normandy-Northern France campaign of June-September 1944. The second objective is to describe the methodological problems likely to be encountered in any effort to glean comparative statistics from the records of the Second World War which may be applicable to future war in Europe. (Author)

AD-779 882/0GA PC$3.25/MF$1.45
Institute for Defense Analyses Arlington Va Program Analysis Div
RATES OF ADVANCE IN INFANTRY DIVISION ATTACKS IN THE NORMANDY-NORTHERN FRANCE AND SIEGFRIED LINE CAMPAIGNS.
Final rept.,
Leonard Wainstein. Dec 73, 28p Rept no. P-990
IDA/HQ-73-15765
Contract DAHC15-73-C-0200

Descriptors: *Army operations, *Infantry, *Force level, *Warfare, Europe, Close support, Area denial, Battles, Enemy personnel, Terrain, History.
Identifiers: *Rates of advance, World War 2.

Historical research is aimed at gaining insights into any relationships which might exist among the key simulation elements of force ratios, casualties, and rates of advance. A representative sample of 90 allied infantry division attacks was prepared in order to illustrate the character of advances achieved and casualties incurred. Fifty of the actions occurred in Normandy-Northern France and thirty-five in the American attack on the Siegfried Line. Five battles from the Ardennes campaign are also included because of the similarity of the terrain to that of the Siegfried Line. The purpose of the paper is not to attempt to establish precise relationships among the factors of rates of advance, casualties, resistance and terrain, but rather to determine general relationships of value to the model builder. (Author)

AD-779 993/5GA PC$5.00/MF$1.45
Army War Coll Carlisle Barracks Pa
THE STRATEGIC IMPORTANCE OF THE POLAR REGIONS TO THE UNITED STATES.
Student essay,
Edward B. Taylor. 22 Oct 73, 37p

Descriptors: *Polar regions, *United States government, Arctic regions, Antarctic regions, Natural resources, Military strategy, Military operations, Army research.

The arctic regions, covering large areas of the earth's surface, are cold and hostile to mankind. The question of the significance of these wastelands to the United States is examined. The Arctic and the Antarctic regions are described separately and their important resources and features are outlined. (Modified author abstract)

AD-780 007/1GA PC$9.50/MF$1.45
Naval Postgraduate School Monterey Calif
A PROPOSED REORGANIZATION OF TEST AND EVALUATION FOR NAVAL AIRCRAFT WEAPON SYSTEMS.
Master's thesis,
William Charles Bowes. Mar 74, 126p

Descriptors: *Naval aircraft, *Weapon systems, Test methods, Management planning and control, Management engineering, Deficiencies, Research management, Department of Defense, Theses.
Identifiers: *Test and evaluation.

The thesis evaluates the Navy's test and evaluation (T and E) process for aircraft weapon systems, identifies problems, and proposes a reorganization of the Navy's T and E agencies. Many changes have been made to improve the T and E process, but some of these have resulted in costly inefficiencies. Contributing problems include: the Navy's 'independent' test agency being tasked more on the basis of its apparent independence than on its testing expertise, lack of actual independence of the many test agencies, excessive testing duplication, inadequate testing expertise, lack of operational test objectives, inadequate test planning, lack of a weapon system T and E school, and numerous T and E management problems. The establishment of a Naval T and E Command which is organizationally separate from the developing agency and the OPNAV program sponsor is proposed. (Modified author abstract)

AD-780 013/9GA PC$4.75/MF$1.45
Mb Associates San Ramon Calif
AIRDROP CONTROLLED EXIT (ACE) SYSTEMS.
Final rept.,
G. L. Fritzler. Jul 73, 143p USA-NLABS-TR-74-38-AD
Contract DAAG17-72-C-0192

Descriptors: *Air drop operations, Parachute decents, Parachute jumping, Platforms, Military personnel, Aerial delivery, Optimization.
Identifiers: ACE(Airdrop Controlled Exit), Airdrop controlled exit.

A study was conducted to identify and compare techniques which minimize ground dispersion of either air dropped troops or platform loads caused by the time increment between sequential exit from the aircraft. Twenty (20) concepts for platform loads and seven (7) concepts for personnel airdrop were determined to have sufficient merit for consideration as operational airdrop systems. Each of these systems reduce drop zone dispersion from that achieved with the presently operational systems. Some of the concepts, however, are diminished in value from a systems standpoint in that attainment of shorter drop zones is accomplished only by introducing some operationally undesirable system characteristic. A comparative evaluation is performed by a scheme that produces figures of merit whereby concepts for either type of airdrop may be compared among themselves and with the currently operational systems. (Author)

AD-780 230/9GA PC$7.00/MF$1.45
Caci Inc Arlington Va
NAVY AIRLIFT MODEL (NAVLIFT) USER'S MANUAL.
Final rept. FY 74,
Joyce D. Maillart, and James H. Wilson. Jan 74, 78p WSAO-R-742
Contract N00019-74-C-0178

Descriptors: *Naval operations, *Air transportation, *Computerized simulation, *User needs, Management planning and control, Scheduling, Decision making, Algorithms, Flight paths, Computer programs.
Identifiers: IBM 360 computers, Scenarios.

The NAVLIFT Model was developed to support the Navy Airlift Study, a study of projected airlift forces. This manual describes the system simulated and the information developed by the model; algorithms and decision logic input format necessary to run the model on IBM-360 computer. The model is used for analyses of alternative strategies in unscheduled airlift operations. Its use can be extrapolated to any transportation system that operates on demand and that calls for spherical point-to-point navigation between terminals. (Author)

AD-780 523/7GA PC$8.50/MF$1.45
Air Force Flight Test Center Edwards AFB Calif
BACKGROUND INFORMATION AND USER GUIDE FOR MIL-S-83691.
Final rept.,
Patrick S. Sharp, and Collet E. McElroy. Mar 74, 109p Rept no. AFFTC-TD-73-2

Descriptors: *Military aircraft, *Aeronautics, *Specifications, User needs, Flight testing, Stalling, Spinning(Motion), Instruction manuals, Bibliographies.
Identifiers: Military specifications, MIL-S-83691.

The report is the Background Information and User Guide (BIUG) for Military Specification MIL-S-83691A (USAF), 'Stall/Post-Stall/Spin Flight Test Demonstration Requirements for Airplanes'. The purposes of the BIUG are: to provide an aid in the interpretation and application of MIL-S-83691A (USAF), and to establish guidelines by which a flight test program can be planned, conducted and reported according to the demonstration specification. It is only an explanatory document and is therefore not contractually binding. However, since the BIUG does amplify upon the intent of the requirements and other provisions of MIL-S-83691A (USAF), it should be considered as a useful tool in the proper technical and contractual application of the flight test specification. (Author)

16. MISSILE TECHNOLOGY

16D. Missiles

AD-780 300/0GA PC$8.75/MF$1.45
Bureau of Naval Weapons Washington D C
PERT PROGRAM EVALUATION RESEARCH TASK.
Summary rept. on Phase 2.
Sep 58, 111p
See also Phase 1, AD-735 902.

Descriptors: *Fleet ballistic missiles, *Management planning and control, Data processing, Decision making.
Identifiers: *PERT.

In January 1958, the Program Evaluation Research Task (PERT) was originated in the Special Projects Office (SP) of the Bureau of Ordnance. The project team was directed to the research and development of improved methods for the planning and control of the complex and far-reaching program developing the Fleet Ballistic Missile (FBM). The PERT team included members of SP, the contractor's organization, and Booz, Allen and Hamilton. Phase I report, issued in July 1958, presented the principal theoretical basis of the work and outlined the proposed installation pattern. The report covers Phase II of the project, which has been essentially the development of detail procedures and mechanics, the modification of concept as experience has proved advisable, and the 'prove out' application of the method in several important areas of the FBM program. This application has demonstrated considerable value. As a result, the application of the method to the entire FBM program has been authorized and is proceeding.

17. NAVIGATION, DETECTION, COMMUNICATIONS, AND COUNTERMEASURES

17A. Acoustic Detection

AD-779 902/6GA PC$3.25/MF$1.45
Royal Aircraft Establishment Farnborough (England)
BEAMFORMING OF SENSOR ARRAYS BY COMPUTER.
Technical rept.,
C. G. Page. Dec 73, 28p Rept no. RAE-TR-73176 DRIC-BR-39343

Descriptors: *Acoustic arrays, *Acoustic signals, *Signal processing, Beam forming, Digital computers, Fourier transformation, Great Britain.

The methods available for the resolution of a signal from a broadband sensor array into its frequency and direction components are discussed with particular emphasis on the use of digital computers and fast Fourier transform processors in the analysis of signals from acoustical arrays. The theory and practice of beamforming by time delays, phase delays, and by the cross spectral method are discussed, and some results are given to illustrate the relative efficiencies on a typical modern computer.

AD-780 241/6GA PC$6.75/MF$1.45
Duke Univ Durham N C Dept of Electrical Engineering
THE THEORY OF SIGNAL DETECTABILITY: EXTENSION TO OPTIMUM ARRAYS.
Summary rept. 1972-73,
Stanley L. Adams. Jul 73, 291p Rept no. TR-9
Contract N00014-67-A-0251-0001

Descriptors: *Signal processing, *Bayes theorem, *Underwater sound, *Acoustic arrays, Correlation techniques, White noise, Stochastic processes, Field theory, Moving targets, Computer programs, Mathematical models, Theses.
Identifiers: *Signal detection, Random processes, Bayesian estimation.

The purpose of this research is to further the theory of signal detectability as applied to systems employing an array of sensors. The specific approach is to make use of optimal space-time likelihood ratio processing for signals which have varying degrees of uncertainty associated with them. A specific type of spatially correlated noise field is incorporated in the model. Optimum receiver structures and their detection performance are derived for far field signal sources of known direction in spatially correlated noise when the signal waveform is either known or uncertain. Optimum receiver structures are derived for detecting active targets of uncertain direction in spatially correlated noise and passive targets of uncertain direction in spatially uncorrelated noise. Optimum receivers and their performance are computed for noise fields with statistics which are a function of space and time. Optimum receiver structures and their performance are computed for moving targets. (Modified author abstract)

AD-780 422/2GA PC$3.25/MF$1.45
Naval Air Development Center Warminster Pa Air Vehicle Technology Dept
RA-3B/SONOBUOY SEPARATION PROGRAM.
Final rept.,
Carl O. Reitz. 31 Dec 73, 33p Rept no. NADC-73250-30

Descriptors: *Sonobuoys, Antisubmarine aircraft, Airborne, Deployment, Launchers, Test equipment, Test methods, Ejection.
Identifiers: S-3A aircraft, S-3 aircraft.

An analytical and empirical examination of the separation of sonobuoys from the modified RA-3B FuNo. 144833 is presented. A sonobuoy launcher which simulates buoy deployments from the S-3A aircraft has been installed in the RA-3B to provide a capability to test the most severe S-3A launch conditions. A digital computer program was used to examine separation trends and identify configurations to be flight tested. Sonobyoys equipped with parachutes or rotochutes and heavier unretarded buoys with a forward located center of gravity were found to separate safely from the RA-3B at speeds at 425 KIAS. Maximum safe deployment speeds are lower for lighter unretarded sonobuoys, or those with a more centrally located center of gravity. Expressions for the ejection velocity from the RA-3B launchers are also derived.

AD-780 443/8GA PC$4.00/MF$1.45
Technology Service Corp Silver Spring Md
STUDIES OF MONOCHROMATIC, QUASI-MONOCHROMATIC AND BROADBAND IMAGING TECHNIQUES,
F. L. Rees, L. B. Palmer, and L. W. Brooks. 18 Mar 74, 78p
Contract N00014-73-C-0267

Descriptors: *Acoustic detection, *Optical images, *Image processing, Passive systems, Bodies of revolution, Geometric forms, Integrals, Underwater sound.

Passive imaging techniques are considered for the entire range of acoustic signal classes. Methods are developed for imaging of monochromatic point-sources, linear distributions of quasi-monochromatic sources (deterministic carrier-frequency with slow and random fluctuations of amplitude and phase), and broadband sources. Imaging of a monochromatic point-source is performed by 'focusing' a synthetic aperture on the radiator. However, this technique is not applicable for wider classes of signals. Thus a power cross-covariance measure of field points is used to image quasi-monochromatic sources. To image broadband sources, it is to show that real apertures must be considered. A subsequent report will provide a unifying theory of passive imaging in the form of a generalized imaging integral. (Author)

AD-780 462/8GA PC$5.25/MF$1.45
General Atronics Corp Philadelphia Pa
SOME PROPERTIES AND EFFECTS OF REVERBERATION IN ACOUSTIC SURVEILLANCE,
Harry Urkowitz. Feb 67, 44p Rept no. GAC-1594-2041-2
Contract N62269-67-C-0028

Descriptors: *Acoustic surveillance, *Reverberation, Signal to noise ratio, Acoustic detection, Waveforms, Correlation techniques, Functions(Mathematics), Spectral energy distribution, Signal processing, Statistical analysis.

Reverberation or clutter may be considered as a special case of an extended, randomly varying target causing an echo which is like noise in that it is approximately a Gaussian random process. In the general case, the statistical properties are not easy to interpret physically, but when the scatterer reflectivity does not vary with time, the statistical properties of the clutter are described by its scattering function which is shown to be the joint probability density function of the distribution of scatterers in delay and in doppler frequency shift. If the delay distribution of the scatterers is uniform over an interval equal to the duration of the transmitted waveform, then the clutter may be considered wide-sense stationary, at least locally, so that it is described by a power density spectrum. (Modified author abstract)

17B. Communication

AD-779 842/4GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
AN EVALUATION OF MODULATION SYSTEMS.
Final rept.,
Don J. Torrieri, and James N. O'Connor. 11 Sep 73, 29p* Rept no. NRL-7609

Descriptors: *Pulse communications, Digital systems, Amplitude modulation, Pulse duration modulation, Pulse position modulation, Bandwidth, White Noise, Information theory, Standard deviation.
Identifiers: *Intersymbol interference, *Amplitude shift keying, *Phase shift keying, *Quadriphase shift keying.

The report summarizes the results of a theoretical and experimental study of the relative strengths and weaknesses of amplitude shift keying, phase shift keying and quadriphase shift keying systems. The report is a combination review report and research monograph. Ideal theoretical results are discussed, and methods of practical realization are described. New research results include the determination of the standard deviation of the arrival time as a function of modulation, simple formulas for the degradation in both digital and analog systems due to adjacent-channel interference, and simple upper bounds for intersymbol interferences. The use of the formulas are all examined experimentally. (Author)

AD-779 845/7GA PC$3.25/MF$1.45
Naval Underwater Systems Center New London Conn New London Lab
ELF FIELD STRENGTH MEASUREMENTS MADE IN CONNECTICUT FROM SEPTEMBER 1973 THROUGH JANUARY 1974.
Technical rept.,
Peter R. Bannister, and Frederick J. Williams. 6 May 74, 43p Rept no. NUSC-TR-4719

Descriptors: *Radio transmission, Extremely low frequency, Field intensity, Far field, Measurement, Connecticut, Superlow frequency, Periodic variations, Seasonal variations, Diurnal variations.

Horizontal magnetic field strength measurements at 42 and 76 Hz were made in Connecticut on a one-week-per-month basis, beginning in September 1973 and extending through January 1974. These measurements are for the purpose of further investigating sunset, nighttime, and seasonal ELF propagation variations. Integration times of 10 to 15 minutes per sample were employed for the majority of the measurements. The transmission source for these 1.6-Mm measurements was the U.S. Navy ELF Wisconsin Test Facility. The principal results obtained from these measurements were: (1) ELF nighttime propagation is much more variable than daytime propagation, and (2) there may be at least 50 nights each year when the average nighttime field strength will be approximately 3 dB lower than on the preceding or following nights. (Author)

AD-779 867/1GA PC$4.00/MF$1.45
Naval Electronics Lab Center San Diego Calif
A PROGRAM FOR COMPUTING EARTH IONOSPHERE ELF/VLF EXCITATION FACTORS FOR SATELLITE-BORNE ANTENNAS.
Interim rept.,
Richard A. Pappert, and Linda R. Shockey. 1 Apr 74, 79p Rept no. NELC-IR-741

Descriptors: *Ionospheric propagation, *Satellite communications, Satellite antennas, Computer programs, Extremely low frequency, Very low frequency, Excitation.

The report presents a variation of an earlier fields program. This variation is designed specifically for the purpose of calculating excitation factors of the earth-ionosphere wave guide by point dipoles at satellite heights. In particular, allowance is made for the following: (1) provision for calculating excitation factors for all electric field components, E sub x, E sub y and E sub z; (2) provision for calculating excitation by both electric and magnetic point dipoles; (3) provision for calculating excitation by vertical, horizontal end on and horizontal broadside configurations. (Author)

AD-779 959/6GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 1. AFRICA I. JANUARY-DECEMBER.
15 Oct 71, 186p
See also Volume 2, AD-779 960.

Descriptors: *Ionospheric propagation, *Africa, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts for Africa (Short Title: ISD Book). There are 31 separate volumes--one for each of the areas of the world shown on the map on page xiii of any volume. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. The first chart provides Maximum usable frequency (MUF) and optimum traffic frequency (FOT) values for each hour. The other 21 charts provide lowest useful high frequency (LUF) value at even two-hour intervals. (Author)

AD-779 960/4GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 2. AFRICA II, JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 3, AD-779 961.

Descriptors: *Ionospheric propagation, *Africa, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 961/2GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 3. AFRICA III. JANUARY-DECEMBER.
15 Oct 71, 184p
See also Volume 4, AD-779 962.

Descriptors: *Ionospheric propagation, *Africa, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 962/0GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 4. AFRICA VI. JANUARY-DECEMBER.
15 Oct 71, 184p
See also Volume 5, AD-779 963.

Descriptors: *Ionospheric propagation, *Africa, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 963/8GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 5. AFRICA V. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 6, AD-779 964.

Descriptors: *Ionospheric propagation, *Africa, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave

Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation/ These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 964/6GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 6. AFRICA VI. JANUARY-DECEMBER.
15 Oct 71, 186p
See also Volume 7, AD-779 965.

Descriptors: *Ionospheric propagation, *Africa, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 965/3GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 7. AFRICA VII. JANUARY-DECEMBER.
15 Oct 71, 185p

Descriptors: *Ionospheric propagation, *Africa, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 966/1GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 8. CENTRAL EUROPE. JANUARY-DECEMBER.
15 Oct 71, 186p

Descriptors: *Ionospheric propagation, *Europe, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 to 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 967/9GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 9. INDIA I. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 10, AD-779 968.

Descriptors: *Ionospheric propagation, *India, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 968/7GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 10. INDIA II. JANUARY-DECEMBER.
15 Oct 71, 184p
See also Volume 11, AD-779 969.

Descriptors: *Ionospheric propagation, *India, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 969/5GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 11. INDIA III. JANUARY-DECEMBER.
15 Oct 71, 185p

Descriptors: *Ionospheric propagation, *India, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 970/3GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 12. JAPAN-KOREA. JANUARY-DECEMBER.
15 Oct 71, 185p

Descriptors: *Ionospheric propagation, *Japan, *Korea, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 971/1GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz

INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 13. MEDITERRANEAN. JANUARY-DECEMBER.
15 Oct 71, 183p
See also Volume 13A, AD-779 972.

Descriptors: *Ionospheric propagation, *Mediterranean Sea, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 972/9GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 13A. IRAN. JANUARY-DECEMBER.
15 Oct 71, 185p

Descriptors: *Ionospheric propagation, *Iran, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at elast through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 973/7GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 14. NORTH EUROPE I. JANUARY-DECEMBER.
15 Oct 71, 186p
See also Volume 15, AD-779 974.

Descriptors: *Ionospheric propagation, *Europe, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distances Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 974/5GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 15. NORTH EUROPE II. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 14, AD-779 973.

Descriptors: *Ionospheric propagation, *Europe, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 975/2GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 16. PHILIPPINES. JANUARY-DECEMBER.
15 Oct 71, 185p

Descriptors: *Ionospheric propagation, *Philippines, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 976/0GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 17. SOUTHEAST ASIA I. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 18, AD-779 977.

Descriptors: *Ionospheric propagation, *Southeast Asia, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 977/8GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 18. SOUTHEAST ASIA II. JANUARY-DECEMBER.
15 Oct 71, 183p
See also Volume 17, AD-779 976.

Descriptors: *Ionospheric propagation, *Southeast Asia, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 978/6GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 19. ALASKA. JANUARY-DECEMBER.
15 Oct 71, 185p

Descriptors: *Ionospheric propagation, *Alaska, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are

shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 979/4GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 20. CARIBBEAN I. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 21, AD-779 980.

Descriptors: *Ionospheric propagation, *Caribbean Sea, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 980/2GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 21. CARIBBEAN II. JANUARY-DECEMBER.
15 Oct 71, 185p
See also AD-779 979.

Descriptors: *Ionospheric propagation, *Caribbean Sea, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 981/0GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 22. NORTH ATLANTIC. JANUARY-DECEMBER.
15 Oct 71, 185p

Descriptors: *Ionospheric propagation, *North Atlantic Ocean, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 982/8GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 23. SOUTH AMERICA I. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 24, AD-779 983.

Descriptors: *Ionospheric propagation, *South America, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 983/6GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 24. SOUTH AMERICA II. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 24, AD-779 984.

Descriptors: *Ionospheric propagation, *South America, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 984/4GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 25. SOUTH AMERICA III. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 26, AD-779 985.

Descriptors: *Ionospheric propagation, *South America, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 100. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 985/1GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 26. SOUTH AMERICA IV. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 27, AD-779 986.

Descriptors: *Ionospheric propagation, *South America, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 986/9GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz

INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 27. SOUTH AMERICA V. JANUARY-DECEMBER.
15 Oct 71, 187p

Descriptors: *Ionospheric propagation, *South America, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 987/7GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 28. UNITED STATES I. JANUARY-DECEMBER.
15 Oct 71, 187p
See also Volume 29, AD-779 988.

Descriptors: *Ionospheric propagation, *United States, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 988/5GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 29. UNITED STATES II. JANUARY-DECEMBER.
15 Oct 71, 185p
See also Volume 28, AD-779 987.

Descriptors: *Ionospheric propagation, *United States, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts. These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 2400 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-779 989/3GA PC$5.50/MF$1.45
Army Communications-Electronics Engineering Installation Agency Fort Huachuca Ariz
INTERMEDIATE AND SHORT DISTANCE SKY-WAVE PROPAGATION CHARTS. VOLUME 30. HAWAII. JANUARY-DECEMBER.
15 Oct 71, 185p

Descriptors: *Ionospheric propagation, *Hawaii, Radio waves, Communication and radio systems, High frequency, Electromagnetic radiation, Charts, Optimization, Time, Predictions, Sunspots, Solar activity, Solar cycle, Ionospheric disturbances, Seasonal variations.

The report is one volume in a set known as the Intermediate and Short Distance Sky-Wave Propagation Charts (Short Title: ISD Book). These charts show the upper and lower limiting frequencies for radio communication in the 2 to 30 MHz band for distances up to 24 km. Predicted values of frequencies are shown for the solar activity extremes for a normal solar cycle; i.e., sunspot numbers of 10 and 110. Values of frequency predictions may be obtained for any time during the normal solar cycle by means of interpolation. These charts will be applicable at least through calendar-year 1976. Within each volume, the predictions are given for six seasonal intervals--January-February, March-April, May-June, July-August, September-October, and November-December. Within each seasonal interval, the predictions are given in a series of 22 charts. (Modified author abstract)

AD-780 109/5GA PC$4.00/MF$1.45
Sperry Rand Corp St Paul Minn UNIVAC Defense Systems Div
PROSODIC AIDS TO SPEECH RECOGNITION. IV. A GENERAL STRATEGY FOR PROSODICALLY-GUIDED SPEECH UNDERSTANDING.
Semiannual technical rept., 1 Sep 73-31 Mar 74,
Wayne A. Lea. 29 Mar 74, 76p* Rept no. PX-10791
Contract DAHC15-73-C-0310, ARPA Order-2010
See also report dated 21 Sep 73, AD-767 392.

Descriptors: *Speech recognition, *Phonetics, Linguistics, Acoustic properties, Syntax, Computer programming, English language.
Identifiers: *Prosodic analysis, Vowels, Consonants.

A strategy is outlined for acoustic aspects of speech recognition, whereby prosodic features are used to detect boundaries between phrases, then stressed syllables are located within each constituent, and a partial distinctive features analysis is done within stressed syllables. Analysis of phonetic recognition results by several research groups showed that automatic phone categorization is much more accurate in stressed syllables. Prosodic features appear to be potentially useful for providing cues to sentence type, syntactic bracketing, occurrences of coordination and subordination, and specific semantic structures. Preliminary acoustic analyses are then followed by an analysis-by-synthesis strategy. (Modified author abstract)

AD-780 174/9GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
UHF FADING FROM A SYNCHRONOUS SATELLITE OBSERVED AT KWAJALEIN OCTOBER 1970 THROUGH JUNE 1972.
Technical note,
Burt E. Nichols. 22 Mar 74, 29p Rept no. TN-1974-19 ESD-TR-74-139
Contract F19628-73-C-0002

Descriptors: *Satellite communications, *Fading(Electromagnetic waves), Ultrahigh frequency, Tactical communications, Communication satellites, Synchronous satellites, Kwajalein Atoll.
Identifiers: TACSAT satellites.

A receiving system was installed on Kwajalein for the purpose of continuously recording the received signal level from the TACSAT beacon at 254.1 MHz in order to help determine the statistics of amplitude fading or scintillation from UHF satellites at near-equatorial latitudes. This note summarizes data recorded from October 28, 1970 through June 20, 1972. Significant periods of fading were observed. Essentially all of the fading occurred between 8:00 pm and 6:00 am local time. Very little fading (less than 4% of the time) occurred during the winter (November to March) and significant fading (over 10% of the time) occurred during the spring and summer (April to August). Fading usually was as much as 10 dB and 20 dB below the average level with accompanying enhancements up to 6 dB. Fading rates usually were in the range of 1 to 3 seconds with occasional longer periods up to 10 seconds. (Author)

AD-780 397/6GA Reprint
California Univ Berkeley Electronics Research Lab
REALIZABILITY OF COMMUNICATION NETS: AN APPLICATION OF THE ZADEH CRITERION.
Interim rept.,
Chuan Chen. 21 Sep 72, 4p AFOSR-TR-74-0836
Contract F44620-71-C-0087
Availability: Pub. in IEEE Transactions on Circuits and Systems, vCAS-21 n1 p150-151 Jan 74.

Descriptors: *Communications networks, *Boolean algebra, Matrices(Mathematics), Inequalities, Theorems, Mathematical models.

The concepts of pseudo-Boolean matrix multiplication and speudo-Boolean matrix adjoint are reviewed. For a given symmetric matrix T to be realizable as the terminal capacity matrix of an unoriented communication net, it is necessary and sufficient for T to be idempotent with respect to multiplication. Another equivalent condition is for T to be self-adjoint. (Author)

AD-780 461/0GA PC$5.50/MF$1.45
Technology Service Corp Santa Monica Calif
REVISION TO THE FREQUENCY TRACKING AND ESTIMATION PROGRAM (PHASE-LOCKED LOOP).
Technical rept.,
Roger M. Golden, and William B. Kendall. Feb 74, 46p Rept no. TSC-PD-067-21
Contract N00014-71-C-0033

Descriptors: *Phase locked communications, *Phase locked systems, Frequency, Tracking, Signal processing, Satellite communications, Electronics, Computer programs.

A number of modifications have been incorporated into the Frequency Tracking and Estimation Program (Phase-Locked Loop). The modifications improve the tracking properties of the PLL as well as make the program more convenient to use. A summary of the modifications along with a description of all of the parameters needed by the program is given in this report. (Author)

PATENT-3 775 690 Not available NTIS
Department of the Air Force Washington D C

RADIO FREQUENCY STORE AND DISPLAY SYSTEM.
Patent,
Richard L. Ravenelle, and David E. Thorburn.
Filed 6 Jul 72, patented 27 Nov 73, 11p Rept nos. PAT-APPL-269 358,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Radio equipment, *Display systems, *Patents, Digital systems, Cockpits, Memory devices, Radiofrequency.
Identifiers: PAT-CL-325-455.

The patent describes a system where the indicated radio frequency to which a communication set is tuned is electrically transferred to, and stored by, a separate visually indicating frequency indicator that retains and displays the stored frequency so that the operator, after tuning to other frequencies, will have indicated before him the frequency of the former transmission, to which he may readily retune, without the need for memorizing or writing down the former frequency.

PB-232 602/3GA PC$3.25/MF$1.45
Stanford Univ., Calif. Dept. of Electrical Engineering and Computer Science.
LOGARITHMIC COMMUNICATIONS NETWORKS.
Technical rept.,
Maurice Schlumberger. May 74, 38p* STAN-CS-74-424, TR-80
Grant NSF-GJ-41093

Descriptors: *Data transmission, *Network flows, Graph theory, Routing, Signal processing, Information theory, Algorithms, Computer networks.
Identifiers: *Communications networks, De Bruijn communications networks.

Most communications networks have a small number of ports or long transmission delays. The author generalizes the notion of de Bruijn graphs in order to construct large networks with short transmission delays, and with as few interconnections as possible. They are characterized by d, the number of connections leaving a node, and n, the number of nodes in the network. It is shown that the access time to any node is proportional to (log of n to the base d), and scheme is given to route messages by using only (log of n to the base d) control digits. This routing scheme does not require global control, but rather requires only local control at the nodes on the path between source and destination nodes.

PB-232 767/4GA PC$5.00/MF$1.45
Washington Univ., St. Louis, Mo. Lab. for Applied Electronic Sciences.
OPTICAL COMMUNICATION SYSTEMS,
William S. C. Chang, and Donald L. Snyder. Nov 73, 155p
Proceedings of a NSF Grantee-User Meeting Held at St. Louis, Mo. on 14-15 Nov 73. Sponsored in part by National Science Foundation, Washington, D.C.

Descriptors: *Optical communication, *Meetings, Photodetectors, Light transmission, Atmospheric attenuation, Atmospheric motion, Optical equipment, Integrated circuits, Fiber optics, Communication theory.

A semi-annual meeting of the NSF Grantee-Users Group in optical communication systems was held. An important objective of these meetings is to provide an interchange among grantees and to encourage the interaction of grantees with potential users in industry and government. The report includes technical discussions from grantees on direct detection receivers, communication in the turbulent atmosphere, integrated optics and discrete devices for detection, multiplexing and generation. Invited papers from users discuss the USAF developments in space laser communications, current and emerging opportunities in optical communications and military applications of fibers and integrated optics.

17D. Electromagnetic and Acoustic Countermeasures

AD-779 815/0GA PC$3.25/MF$1.45
Sperry Research Center Sudbury Mass
TIME DOMAIN MEASUREMENT OF MICROWAVE ABSORBERS 9-16 GHZ FREQUENCY BAND.
Final technical rept. 15 Apr-31 Oct 73,
A. M. Nicolson, Harry M. Cronson, Peter G. Mitchell, and Richard M. Mara. Apr 74, 42p Rept no. SCRC-CR-73-10 AFAL-TR-73-435
Contract F33615-73-C-1278

Descriptors: *Absorbers(Equipment), *Time domain, Microwaves, Measurement, Pulse generators, Dielectric properties, Constants, Permeability(Magnetic), Ferrites, *Teflon, Data processing, FORTRAN.

The report describes a time domain metrology system built to extend the measurement capability of the properties of radar absorbing materials used on aircraft and missiles. A system is presently operating in the Air Force Avionics Laboratory, WPAFB, which measures the transient response of subnanosecond risetime pulses and calculates the dielectric constant epsilon* and the magnetic permeability mu* over the frequency range 0.1-10 GHz. The system to be described will extend this capability through the frequency range 9-16 GHz. (Author)

AD-780 163/2GA PC$5.00/MF$1.45
Ohio State Univ Columbus Electroscience Lab
AN ADAPTIVE ARRAY AND ANGLE OF ARRIVAL ESTIMATION SYSTEM FOR SENSOR COMMUNICATIONS.
Final rept.,
W. G. Swarner, and A. J. Berni. Apr 74, 154p Rept no. ESL-3435-2

Descriptors: *Communication and radio systems, *Antenna arrays, *Radio antijamming, Angle of arrival, Detectors, Interference, Rejection, Monitoring, Remote detectors, Electronic countermeasures, Adaptive systems.

Design, development, and testing of a 4-element 4-channel adaptive array for interference rejection and of an angle of arrival estimation device for use with the Phase III remote sensor communications system are described. The adaptive array provides simultaneous monitoring of four selected sensor channels within the 162-174 MHz sensor band while nulling up to three interfering signals from spatial directions to within 2.5 degrees of the desired signals. The angle of arrival estimation system determines the angle of arrival estimation system determines the directions of multiple incident signals simultaneously. (Modified author abstract)

17E. Infrared and Ultraviolet Detection

LBL-2222 PC$3.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
SUPERCONDUCTING TUNNEL JUNCTION BOLOMETERS.
J. Clarke, G. I. Hoffer, and P. L. Richards. Aug 73, 9p CONF-730990-1
Contract W-7405-eng-48

Descriptors: (*Bolometers, *Superconducting junctions), Infrared radiation, Operation, Radiation detection.

For abstract, see NSA 29 12, number 30678.

PATENT-3 728 543 Not available NTIS
Department of Health, Education, and Welfare, Washington, D.C.
THERMOLUMINESCENCE OF SAPPHIRE.
Patent,
William Gordon Buckman, David C. Sutherland, and David W. Cooke. Filed 23 Nov 71, patented 17 Apr 73, 7p PAT-APPL-201 458,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Patents, *Sapphire, *Ultraviolet detectors, Powders, Impurities, Manganese, Chromium, Iron, Titanium.
Identifiers: PAT-CL-250-71-R, *Thermoluminescent dosimeters.

The patent describes a novel technique and dosimetric material for the detection and measurement of ultraviolet radiation. Nominally pure sapphire containing trace impurities such as manganese, chromium, iron and titanium is ground into a powder form of approximately 200 mesh particle size, The sapphire is then excited with incident ultraviolet radiation and subsequently heated whereby the sapphire thermoluminesces. The intensity of the resulting luminescence is a measure of the ultraviolet radiation dosage to which the sapphire has been exposed.

17G. Navigation and Guidance

AD-779 851/5GA PC$9.75/MF$1.45
Hughes Aircraft Co Culver City Calif Display Systems and Human Factors Dept
DESIGN CRITERIA FOR AIRBORNE MAP DISPLAYS. VOLUME I. METHODOLOGY AND RESEARCH RESULTS.
Final rept.,
W. L. Carel, J. J. McGrath, M. L. Hershberger, and J. A. Herman. Mar 74, 480p Rept no. HAC-Ref-C2151-003-Vol-1 JANAIR-731101-Vol-1
Contract N00014-71-C-0070
See also Volume 2, AD-779 852. Prepared in cooperation with Anacapa Sciences, Inc., Santa Barbara, Calif.

Descriptors: *Display systems, *Navigational aids, *Aircraft equipment, Maps, Contrast, Resolution, Human factors engineering, Attack bombers, Jet fighters, Helicopters.
Identifiers: Design criteria, Legibility, A-7 aircraft, A-7E aircraft, UH-1B aircraft, H-1 aircraft.

The work accomplished under the contract is reported in two volumes. Volume I describes the methods used to develop the design criteria and the results of the surveys, analyses, and experimental research conducted in the course of the program. The research is categorized under the following headings: (1) mission requirements analysis, (2) the legibility problem, (3) a survey of contemporary map displays, (4) a survey of users of operational map displays, and (5) a survey of contemporary cartographic support systems. (Modified author abstract)

AD-779 852/3GA PC$5.50/MF$1.45
Hughes Aircraft Co Culver City Calif Display Systems and Human Factors Dept
DESIGN CRITERIA FOR AIRBORNE MAP DISPLAYS. VOLUME II. DESIGN CRITERIA.
Final rept.,
W. L. Carel, M. L. Hershberger, J. A. Herman, and J. J. McGrath. Mar 74, 182p Rept no. HAC-Ref-C2151-003-Vol-2 JANAIR-731101-Vol-2
Contract N00014-71-C-0070
Prepared in cooperation with Anacapa Sciences, Santa Barbara, Calif. See also Volume 1, AD-779 851.

Descriptors: *Display systems, *Navigational aids, *Aircraft equipment, Maps, Resolution, Contrast, Human factors engineering, Attack bombers, Jet fighters, Helicopters.
Identifiers: Design criteria, Legibility, A-7E aircraft, A-7 aircraft.

This is the final report of research conducted under ONR contract N00014-71-C-0070, NR 213-075 entitled Development of Design Criteria for Projected Map Displays. Volume 2 consists of the statement of the design criteria. The criteria described are grouped under two main headings: (1) The Displayed Map Image and (2) Other Design Issues. Criteria appropriate to the displayed map image were developed from operational requirements and from legibility requirements. Criteria appropriate to other design issues deal with features of map displays that are not directly related to the displayed map image; i.e., operating modes, controls, updating, and the like.

AD-779 911/7GA PC$6.50/MF$1.45
Lear Siegler Inc Grand Rapids Mich Instrument Div
DEVELOPMENT OF AN OPTICAL RATE SENSOR.
Final rept. 1 May-31 Oct 73,
Wilbur A. Carrington, and Ronald J. Fredericks.
Nov 73, 258p Rept no. GRR-004-0474
Contract N00014-73-C-0377

Descriptors: *Detectors, Inertial systems, Optical equipment, Rates, Angles, Phase measurement, Feasibility studies.

The report documents the results of a feasibility study program in optical rate sensing by a unique technique of differential phase shift measurement between counter-traveling light beams forming a closed path. The program involved the analysis of component error sources in such a sensor and the testing of critical individual components to verify the results of analysis. Such a sensor possesses many of the attributes of the ring laser gyro without the problem of frequency lock-in which is characteristic of that device. It also offers the potential of size reduction without performance degradation through the use of fiber or integrated optics for effective area increase and replacement of the gas laser with a solid state source. (Modified author abstract)

AD-780 015/4GA PC$3.00/MF$1.45
Army Natick Labs Mass
AZIMUTH HOMING IN A PLANAR UNIFORM WIND.
Technical rept.,
Arthur L. Murphy, Jr. Apr 73, 18p Rept no. USA-NLABS-TR-74-42-AD

Descriptors: *Terminal guidance, Azimuth, Flight paths, Gliding, Trajectories, Differential equations, Numerical integration, Control, Wind, Air drop operations, Homing.

The planar trajectory of an Azimuth Homing gliding system maneuvering through a uniform wind field is presented. The kinematics of the motion is discussed generating two first order differential equations which are separated producing an expression involving only position coordinates. A change of variables is introduced and exact solutions obtained by direct integration. The resulting trajectories fall into two categories classified according to their Target Seeking or Orbital characteristics. Flight paths in the Target Seeking domain are shown to be convergent when the system has a wind penetration capability. The family of Target Orbiting solutions are shown to produce trajectories which are captured about the target in Elliptic spirals. Launch criteria are established from the time solution which takes the form of an ellipse for all the categories of Azimuth Homing. The definition of a Release Path as the locus of points from which the flight time necessary to reach the target is constant, follows from this result. (Author)

AD-780 159/0GA PC$3.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
PROVISIONAL MESSAGE FORMATS AND PROTOCOLS FOR THE DABS 32-CHARACTER ALPHANUMERIC DISPLAY.
Project rept.,
J. D. Welch, and G. V. Colby. 20 May 74, 13p Rept no. ATC-36 FAA-RD-74-84
Contract DOT-FA72WAI-261

Descriptors: *Air traffic control systems, *Display systems, Data links, Radar beacons, Message processing.
Identifiers: DABS(Discrete Address Beacon Systems), Discrete address beacon systems, Alphanumeric displays.

Formats and protocols are described for tactical ATC displays to be driven by the Standard Message interface of a DABS transponder and capable of handling a succession of data transmissions, each of which is individually acknowledged via a transponder reply before the transmission of the succeeding segment. Specific codes are defined for a display device of up to 32 alphanumeric characters. Any displays defined or implied by this document are intended solely for use in the DABS test and evaluation program, and are not necessarily representative of recommended or required display devices for an operational DABS system. (Author)

AD-780 189/7GA PC$3.00/MF$1.45
Stanford Research Inst Menlo Park Calif
LORAN PROPAGATION.
Technical rept.,
S. M. Berman. Apr 74, 24p Rept no. SRI-JSR-73-7
Contract DAHC15-73-C-0370

Descriptors: *Loran, *Radio transmission, Low frequency, Electromagnetic wave propagation, Ground waves(Electromagnetic), Arrival.
Identifiers: Loran C navigation systems.

The possibility of using position independent weighted averages of phase and signal arrival times to eliminate the corrections in these times caused by intervening media is examined for the case of Loran C ground waves. Three analytically simple examples are considered--short, longitudinal, homogeneous paths; longitudinal paths with one inhomogeneity; and first-order corrections to longitudinally homogeneous paths taking into account the sphericity of the earth. In each of these cases suitable weighted averages can be made in which one unknown such as the media conductivity can be eliminated. (Author)

AD-780 295/2GA PC$3.25/MF$1.45
Federal Aviation Agency Washington D C
A PROBABILITY MODEL OF THE AIRCRAFT SEPARATION PROBLEM.
Jan 61, 40p

Descriptors: *Air traffic control systems, *Flight paths, Collisions, Commercial planes, Scheduling, Probability, Mathematical models.
Identifiers: *En route traffic control systems, *Collision avoidance.

The paper presents a mathematical model of the relationship between aircraft separation and flight variability for aircraft on airways routes in terms of collision probability. The development yields a closed form of this relationship which shows the effects of the three space dimensions and time itself on this problem. A discussion of the assumptions and approximations of the formulation are set forth in an appendix to the paper. A second appendix offers a manner for determining a point of diminishing return which provides a low collision hazard and at the same time trades off a small amount of separation to be provided for the aircraft. (Author)

AD-780 296/0GA PC$4.75/MF$1.45
Federal Aviation Agency Washington D C
A PROBABILITY MODEL OF THE AIRCRAFT SEPARATION PROBLEM.
Warren Taylor. 1 Apr 60, 32p

Descriptors: *Air traffic control systems, *Flight paths, Collisions, Commercial planes, Scheduling, Probability, Mathematical models.
Identifiers: *En route traffic control systems, *Collision avoidance.

The paper presents a mathematical model of the relationship between aircraft separation and flight variability for aircraft on airways routes in terms of collision probability. The development yields a closed form of this relationship which shows the effects of the three space dimensions and time itself on this problem. A discussion of the assumptions and approximations of the formulation are set forth in an appendix to the paper. A second appendix offers a manner for determining a point of diminishing return which provides a low collision hazard and at the same time trades off a small amount of separation to be provided for the aircraft. (Author)

AD-780 380/2GA PC$3.75/MF$1.45
National Aviation Facilities Experimental Center Atlantic City N J
INVESTIGATION OF THE REFLECTED RADAR-BEACON REPLY PROBLEM AT THE NORTH PLATTE, NEBRASKA, EN ROUTE RADAR SITE.
Interim rept. Jun-Dec 72,
George F. Spingler. Apr 74, 70p Rept no. FAA-NA-73-36 RAA-RD-74-68

Descriptors: *Radar beacons, *Air traffic control systems, Radar antennas, Modification, Terrain, Reflectance, Nebraska.
Identifiers: ARSR-2 Radar.

An investigation was made to determine the cause of a split radar-beacon reply problem that existed in the system. It was concluded from this investigation that the terrain in the vicinity of the North Platte facility together with the radar beacon directional antenna that was installed at the facility were responsible for the split radar-beacon reply problem. An improved radar beacon directional antenna, that utilized the ARSR-2 radar reflector, was designed, fabricated and tested at NAFEC to reduce beacon radiations below the horizon. This antenna was afterward installed and tested at the North Platte facility. The results of the testing at the North Platte facility showed that the new antenna design had eliminated the split radar-beacon reply problem. From the results of the testing at North Platte, it was concluded that this antenna could be used at other en route radar facilities to eliminate existing propagation problems. (Modified author abstract)

AD-780 381/8GA PC$3.25/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
PROVISIONAL MESSAGE FORMATS AND PROTOCOLS FOR THE DABS IPC/PWI DISPLAY.
Project rept.,
P. H. Robeck, and J. D. Welch. 24 May 74, 26p
Rept no. ATC-35 FAA-RD-74-83
Contract DOT-FA72WAI-261

Descriptors: *Air traffic control systems, *Message processing, Data links, Display systems, Cockpits.
Identifiers: DABS(Discrete Address Beacon Systems), Discrete address beacon systems.

The document specifies provisional formats for the data link portion of the 'signals-in-space' which are part of the DABS interrogations and replies. Also included is a discussion of the characteristics that these signals assume while transmitted from the transponder proper to the instrument which delivers the messages to the pilot. Specifically, formats, algorithms, and protocols are assigned to serve the IPC (Intermittent Positive Control), PWI (Proximity Warning Indicator), and ATC (numerical indicator) functions. The protocol and algorithm for the pilot acknowledgment link is also included in this paper. (Author)

17H. Optical Detection

AD-779 854/9GA PC$5.75/MF$1.45
General Research Corp Arlington Va
SPACE OBJECT LASER ANALYSIS (SOLA).
Final technical rept. 1 Oct 72-30 Sep 73,
M. Horrocks, E. Chang, A. Eckert, G. Gurski, and F. Sevcik. Feb 74, 11p Rept no. GRC-CR-1-351
RADC-TR-73-413
Contract F30602-73-C-0039

Descriptors: *Optical radar, *Space surveillance systems, Lasers, Signal processing, Identification systems, Space objects.
Identifiers: SOLA(Space Object Laser Analysis), Space object laser analysis.

The space object laser analysis (SOLA) provided analytic support to the CORAL (Coherent Optical Radar Laboratory) activities at Rome Air Development Center. The primary effort reported here was performed during the final half of the contract period and is concentrated on the signal processing and data management aspects of space object identification and analysis with a coherent laser radar system. Laser hardware system formats and the relationship and potential use of microwave radars are also discussed. (Author)

PATENT-3 809 477 Not available NTIS
Department of the Interior, Washington, D.C.
MEASURING APPARATUS FOR SPATIALLY MODULATED REFLECTED BEAMS.
Patent,
James T. Russell. Filed 1 Nov 72, patented 7 May 74, 8p PAT-APPL-302 960, DOCKET/MIN-1913
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Optical detection, *Distance measuring equipment, *Patents, Electrooptics, Lasers, Displacement, Measuring instruments.
Identifiers: PAT-CL-356-5.

The patent describes a modulated displacement indicator and its method of use that utilizes unfocused electromagnetic waves, like laser waves, which are spatially modulated. Either an angular direction or linear displacement can be obtained depending on whether the beam is divergent or parallel. (Modified author abstract)

17I. Radar Detection

AD-780 047/7GA PC$4.50/MF$1.45
Raytheon Co Wayland Mass Equipment Div
ARSR-2 RADAR DUAL FEEDHORN ANTENNA MODIFICATION.
Final rept. Jun 69-Aug 72,
P. E. Rawlinson. Dec 73, 122p FAA-RD-73-28
Contract DOT-FA69WA2129

Descriptors: *Radar antennas, Horn antennas, Antenna feeds, Modification, Search radar, Radar clutter, Air traffic control systems, Antenna radiation patterns.
Identifiers: ARSR-2 radar, Design.

The intent of these efforts was to determine the feasibility of a dual feedhorn configuration employed with the ARSR-2 antenna reflector. The feedhorn geometry was modified by adding a separate receive only feedhorn and polarizer to produce separate antenna two-way coverage patterns for the close-in and long-range capabilities of the radar system. The close-in coverage was obtained by transmission on the normal (low) beam and reception on the second (high or tilted-up) beam. The long range coverage was obtained by both transmission and reception on the normal beam. The effort was divided into three parts: (1) analysis of the problems associated with placing a second feedhorn in the focal region of the reflector and with generating good circular polarization characteristics for both beam patterns; (2) design and fabrication of the necessary antenna feed network hardware; and (3) performance of experimental measurements. (Modified author abstract)

AD-780 048/5GA PC$4.50/MF$1.45
Raytheon Co Wayland Mass Advanced Development Lab
WIDE-ANGLE LIMITED SCAN ARRAY ANTENNA TECHNIQUES STUDY.
Final rept. 11 Jun-11 Dec 73,
Chien H. Tang, Ruey S. Chu, and Charles F. Winter. 1 May 74, 102p

Descriptors: *Lens antennas, *Radar antennas, *Antenna arrays, Phased arrays, Scanning, Wide angles, Radar tracking, Antenna apertures, Monopulse radar.

A duel lens antenna design concept is investigated for the limited electronic scanning for the Range Instrumentation Radar Application. The antenna is to perform simultaneous monopulse angle tracking on multiple targets. The design goal for the antenna is a scan area of plus or minus 10 degrees in elevation and plus or minus 20 degrees in azimuth. The antenna beamwidth is specified at 1 degree. Based on an extensive trade-off study, an antenna configuration that satisfies the above requirements is selected. The antenna is a telescope-like structure which has an aperture of 11.4 min. The length to diameter ratio of the overall antenna dimension is estimated to be 2. The selected antenna configuration has been evaluated analytically. The design is believed to be a viable one and no insurmountable difficulty in fabricating the antenna has been found. The originally anticipated advantages of the antenna configuration, such as no blockage, minimum aperture size requirement, wide scan angle, small number of required phase shifters and good pattern control, are still intact. Encouraged by the computed results, an antenna hardware definition study for the antenna system cost estimate is recommended. (Author)

17J. Seismic Detection

AD-779 933/1GA PC$3.75/MF$1.45
Cooperative Inst for Research in Environmental Science Boulder Colo
SEISMIC WAVE PROPAGATION AND EARTHQUAKE CHARACTERISTICS IN ASIA.
Semi-annual technical rept. no. 1, 1 Oct 73-31 Mar 74,
C. Kisslinger, E. R. Engdahl, G. Boucher, and R. Ganse. 30 Apr 74, 65p AFOSR-TR-74-0866
Contract F44620-74-C-0015, ARPA Order-1827

Descriptors: *Seismic detection, *Earthquakes, *Asia, Seismological stations, Seismic data, Ray tracing, Seismic waves, Seismometers, Power spectra, Underground explosions, Nuclear explosions, Structural geology, Earth mantle, Discrimination, Signal to noise ratio.
Identifiers: Long period seismometers, Focal mechanisms.

Three-dimensional seismic ray tracing leads to improved hypocenter locations and focal mechanism solutions. Relations of events to upper mantle structure to under the Aleutian arc are classified. Long-period P waves are very weak on HGLP seismograms of explosions, but long-period SV waves are seen. Long period body wave spectra can be used to fix the depth of crustal earthquakes. Body wave spectra, magnitudes, and focal mechanisms for events in from seismic zones of central Asia have been determined. (Author)

AD-780 088/1GA PC$6.25/MF$1.45
Royal Norwegian Council for Scientific and Industrial Research Kjeller
ANALYSIS OF CODA AND MULTIPATH PROPAGATION OF RAYLEIGH WAVES AT NORSAR.
Scientific rept.,
H. Bungum, and J. Capon. 3 Jan 74, 62p Rept no. NORSAR-Scientific-3-73/74 AFOSR-TR-74-0793
Contract F44620-74-C-0001

Prepared in cooperation with Massachusetts Inst. of Tech., lexington. Lincoln Lab. Seismic Discrimination Group.

Descriptors: *Seismic detection, *Underground explosions, Seismological stations, Norway, Seismic arrays, Seismometers, Earthquakes, Nuclear explosions, Identification, Multipath transmission, Rayleigh waves, Power spectra.
Identifiers: *Norwegian seismic array.

Frequency-wavenumber analysis of coda of 40 and 20 sec Rayleigh waves recorded at NORSAR shows that 40 sec period coda drops off faster vs. time while the resolving power of the array is better at 20 sec. Multipath arrivals with as much as 40-60 degrees are frequently identified, and travel path solutions for some events are proposed. As an example, 20 sec Rayleigh waves from a nuclear explosion are identified in the presence of an interfering event.

AD-780 091/5GA PC$4.00/MF$1.45
Royal Norwegian Council for Scientific and Industrial Research Kjeller
SEMIANNUAL TECHNICAL REPORT NORSAR PHASE 3, 1 JULY-31 DECEMBER 1973,
Hilmar Bungum. 11 Jan 74, 78p Rept no. NORSAR-Scientific-4-73/74 AFOSR-TR-74-0794
Contract F44620-74-C-0001
See also AD-734 949.

Descriptors: *Seismic detection, *Underground explosions, Seismological stations, Norway, Earthquakes, Nuclear explosions, Operation, Seismometers, Performance(Engineering).
Identifiers: Norwegian seismic array, Short period seismometers, Long period seismometers.

The activity in this reporting period is characterized by a continued concentration of research on short period data, and some work using long period data. The physical operation of the array is characterized by stability. (Modified author abstract)

AD-780 126/9GA PC$3.25/MF$1.45
Wisconsin Univ Milwaukee Dept of Geological Sciences
MULTIPLE SEISMIC EVENTS.
Semiannual technical rept. no. 1,
David E. Willis, and Robert W. Taylor. 15 Apr 74, 33p AFOSR-TR-74-0864
Grant AF-AFOSR-2543-73, ARPA Order-1827

Descriptors: *Seismic detection, *Seismic data, *Underground explosions, Seismological stations, Earthquakes, Nuclear explosions, Microseisms, Discrimination, Intensity, Sources, Power spectra, Correlation techniques, Spectrum analysis.
Identifiers: Cepstrum technique, Seismic discrimination.

Visual records from all available sources for eight nuclear shots of a multiple nature have been obtained and converted to digital form. Identification logic employing Cepstrum analysis has been established and the application of this logic to real data is presently under investigation. Preliminary results with Cepstrum analysis appear encouraging. Identification logic including the use of P-wave radiation patterns and/or cross correlation with signals of known origin are being considered. Preliminary results indicate that for distance ranges of 100 km to 1000 km the P-wave radiation pattern may provide a viable means of identification. M sub L and m sub b magnitude relationships were developed for shots and earthquakes. Triggering of microearthquakes by tidal forces were also investigated. (Author)

18. NUCLEAR SCIENCES AND TECHNOLOGY

18A. Fusion Devices (Thermonuclear)

BNL-18718 PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
TECHNOLOGY AND ECONOMICS OF HYDROGEN PRODUCTION FROM FUSION REACTORS.
J. Powell, F. F. Salzano, and W. A. Sevian. 1974, 17p CONF-740306-8

Descriptors: (*Thermonuclear reactors, *Synthetic fuels), (*Hydrogen, *Production), Cost, Economics, Gas fuels, Liquid fuels, Methanol.

For abstract, see NSA 29 12, number 31448.

BNL-18745 PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
CONTROLLED THERMONUCLEAR RESEARCH. SURVEY OF APPLICATIONS OF FUSION POWER AND TECHNOLOGY TO THE CHEMICAL AND MATERIALS PROCESSING INDUSTRIES. BIMONTHLY REPORT NO. 4, JANUARY--FEBRUARY 1974.
M. Steinberg, J. Powell, and M. Beller. 1974, 6p

Descriptors: (*Thermonuclear reactors, *Energy sources), Breeding blankets, Coolants, Helium, Thermodynamics.

For abstract, see NSA 29 12, number 30957.

BNWL-B-287 PC$4.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
PROJECTION OF GRAPHITE BEHAVIOR IN VERSION III OF THE ORNL CONCEPTUAL FUSION REACTOR.
W. J. Gray, and W. C. Morgan. 1973, 45p
Contract AT(45-1)-1830

Descriptors: (*Graphite, *Physical radiation effects), (*Thermonuclear reactors, *Reactor materials), Cross sections, Heating, Neutron reactions.

For abstract, see NSA 29 12, number 30958.

CONF-721111- PC$16.60/MF$1.45
Texas Univ., Austin (Usa).
TECHNOLOGY OF CONTROLLED THERMONUCLEAR FUSION EXPERIMENTS AND THE ENGINEERING ASPECTS OF FUSION REACTORS. PROCEEDINGS OF A SYMPOSIUM HELD AT AUSTIN, TEXAS, NOVEMBER 20--22, 1972. AEC SYMPOSIUM SERIES 31.
E. L. Jr. Draper. Apr 74, 1052p

Descriptors: (*Plasma, *Meetings), (*Thermonuclear reactors, Meetings).

For abstract, see NSA 29 12, number 30967.

IPP-2-218 PC$5.00/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
EFFECT OF PERTURBATIONS ON THE MAGNETIC FIELD OF THE W VII-STELLARATOR.
S. Rehker, and H. Wobig. Jan 74, 38p

Descriptors: (*W stellarators, *Magnetic field configurations), Magnet coils, Magnetic fields, Surfaces.

For abstract, see NSA 29 12, number 31009.

LA-UR-74-280 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
PHYSICS PROBLEMS OF THERMONUCLEAR REACTORS.
F. L. Ribe. 1974, 20p CONF-731142-1

Descriptors: (*Thermonuclear reactors, *Energy balance), Alpha particles, Deuterium, Magnetic mirrors, Thermonuclear reactions, Tokamak devices, Toroidal theta pinch devices, Tritium.

For abstract, see NSA 29 12, number 31010.

MATT-1006 PC$4.25/MF$1.45
Princeton Univ., N.J. (Usa). Plasma Physics Lab.
ACTIVATION AND AFTERHEAT IN A FUSION POWER REACTOR.
W. G. Jr. Price. Oct 73, 21p
Contract AT(11-1)-3073

Descriptors: (*Thermonuclear reactors, *Afterheat), Cobalt 60, Neutron reactions, Radioisotopes, Reactor materials, Stainless steels, Thermodynamics, Vanadium.

For abstract, see NSA 29 12, number 31011.

UCRL-74943 PC$3.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
REVIEW OF 2XIIB PROJECT.
C. J. Anderson. 20 Aug 73, 12p CONF-731114-52

Descriptors: (*2x devices, *Reviews), Cost, Fabrication, Magnet coils, Neutral atom beam injection, Research programs, Specifications.

For abstract, see NSA 29 12, number 31012.

UCRL-75547 PC$4.25/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
DESIGN STUDY OF A NEUTRAL INJECTION SYSTEM FOR THE FUSION ENGINEERING RESEARCH FACILITY (FERF).
G. W. Hamilton, W. L. Dexter, and B. H. Smith. 14 Mar 74, 22p CONF-740402-4

Descriptors: (*Magnetic mirrors, *Beam injection heating), (*Plasma heating, Beam injection heating), Charge exchange, Design, Deuterium, Ion beams, Molecular beams, Tritium.

For abstract, see NSA 29 12, number 31013.

18B. Isotopes

BNWL-1744 PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
LIST OF AEC RADIOISOTOPE CUSTOMERS WITH SUMMARY OF RADIOISOTOPE SHIPMENTS, FY 1972.
J. L. Simmons. Nov 73, 37p
Contract AT(45-1)-1830

Descriptors: (*Radioisotopes, *Market), Transport.

For abstract, see NSA 29 12, number 29640.

LA-UR-74-340 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
CRYOGENICS SAFETY IN A HYDROGEN FUEL SOCIETY.
R. Reider, F. J. Edeskuty, and K. D. Jr. Williamson. 20p CONF-740509-1
Contract W-7405-eng-36

Descriptors: (*Hydrogen, *Safety), Cryogenics, Storage, Synthetic fuels.

For abstract, see NSA 29 12, number 31464.

LBL-2446 PC$3.50/MF$1.45
California Univ., Berkeley (Usa). Donner Lab.; California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
RADIONUCLIDE GENERATORS: CURRENT AND FUTURE APPLICATIONS IN NUCLEAR MEDICINE.
Y. Yano. Nov 73, 26p CONF-740203-7
Contract W-7405-eng-48

Descriptors: (*Technetium 99, *Isotope production), (*Indium 113, Isotope production), (*Strontium 87, Isotope production), (*Barium 137, Isotope production), Cesium 128, Iridium 191, Isomeric nuclei, Nuclear medicine, Radioisotope generators, Radiopharmaceuticals, Rubidium 82, Uses.

For abstract, see NSA 29 12, number 29189.

ORNL-4921 PC$4.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
TRANSURANIUM PROCESSING PLANT SEMI-ANNUAL REPORT OF PRODUCTION, STATUS, AND PLANS FOR PERIOD ENDING JUNE 30, 1973.
L. J. King, J. E. Bigelow, and E. D. Collins. Mar 74, 38p
Contract W-7405-eng-26

Descriptors: (*Transuranium elements, *Production), (*Neutron sources, *Fabrication), Berkelium 249, Californium 249, Californium 252, Curium 243, Curium 245, Curium 246, Curium 248, Einsteinium 253, Einsteinium 254, Fermium 257, Plutonium 242, Plutonium 244, Research programs.

For abstract, see NSA 29 12, number 29190.

SRARI-P-195 PC$4.00/MF$1.45
Nauchno-Issledovatel'Skij Inst. Atomnykh Reaktorov, Dimitrovgrad (Ussr).
POSSIBILITY OF OBTAINING ENRICHED AMERICIUM-242G BY THE ELUTION OF RECOIL ATOMS FROM ZEOLITE.
A. I. Shafiev, V. M. Vityutnev, V. M. Ivanov, and G. N. Yakovlev. 1973, 9p
In Russian.

Descriptors: (*Americium 242, *Isotope production), Americium 241, Isotope separation, Leaching, Nuclear reaction yield, Recoils, Targets, Zeolites.

For abstract, see NSA 29 12, number 29191.

18C. Nuclear Explosions

AD-780 089/9GA PC$3.25/MF$1.45
Mathematical Applications Group Inc Elmsford N Y
SOURCES OF COMPTON CURRENTS FROM NUCLEAR BURSTS IN THE ATMOSPHERE.
Final rept.,
Martin O. Cohen. Apr 74, 34p Rept no. MR-7038
HDL-TR-252-1
Contract DAAG39-73-C-0252

Descriptors: *Nuclear explosions, *Compton scattering, Airburst, Gamma ray scattering, Neutron spectrum, Monte Carlo method.
Identifiers: SAM-CE computer code.

A series of Monte Carlo calculations were performed to determine the energy deposition and Compton electron sources in air arising from atmospheric nuclear bursts. The time-dependent results were obtained in 92 radial and altitude scoring bins surrounding a burst 200 meters above the ground. Ranges of 0 to 333gm/cm squared were considered in all directions from the source. Both a representative gamma ray and a thermonuclear neutron source were investigated. (Author)

AD-780 192/1GA PC$4.50/MF$1.45
TRW Systems Group Redondo Beach Calif
FIREBALL ENTRAINMENT STUDY.
Final rept. 18 Aug 71-30 Sep 73,
David D. Mantrom, and Wayne W. Haigh. 30 Sep 73, 111p Rept no. 18895-6004-RU-00 DNA-3248F

Contract DNA-001-72-C-0019, ARPA Order-1433
See also report dated Nov 73, AD-771 276.

Descriptors: *Nuclear fireball, *Entrainment, *Turbulent diffusion, Nuclear explosions, Holography, Interferometry, Particles, Tracking, Vortices, Airburst.

An experimental program to study the development and entrainment processes of fireballs is described. The high pressure test facility and diagnostic equipment developed for this subscale laboratory study are discussed. Data acquisition, interpretation, and reduction techniques are outlined. Turbulent and laminar mean size/rise data and particle tracking photographs are compared and results reflect marked differences between these two flow regimes. Properly scaled turbulent dimensional data compare favorably with those of a low yield, low altitude nuclear event. (Modified author abstract)

AD-780 193/9GA PC$3.25/MF$1.45
TRW Systems Group Redondo Beach Calif
MULTIBURST STUDY.
Final rept. 26 Dec 72-31 Oct 73,
David D. Mantrom. 31 Dec 73, 48p Rept no. TRW-23629-6001-RU-00 DNA-3267F
Contract DNA001-73-C-0085

Descriptors: *Nuclear explosions, *Nuclear fireball, Airburst, Simulation, Blast, Overpressure, Shock tubes, Scaling factors, Spectrum signatures.
Identifiers: *Multibursts.

An experimental program to study shock/fireball interactions is described. Preliminary experiments led to the hypothesis that it is the magnitude of shock-induced circulation within the fireball relative to self-generated circulation which governs the post-shock fireball motion. A scaling of sorts relating the full scale scenarios to the laboratory tests is discussed based upon this circulation argument. Experiments were performed using an open-ended shock tube as the shock generator and helium bubbles in a ten atmosphere air environment as the simulated fireballs. (Modified author abstract)

AWRE-O-11-74 PC$8.75/MF$1.45
Ukaea Weapons Group, Aldermaston. Atomic Weapons Research Establishment.
PEACEFUL USES OF NUCLEAR EXPLOSIVES. REVIEW PAPER NO. 1. RADIOACTIVITY AND PNE.
R. Lapage. Feb 74, 114p

Descriptors: (*Nuclear explosions, *Excavation), (*Cratering explosions, *Radiation hazards), (*Soils, *Radionuclide migration), (*Rocks, Radionuclide migration), Contained explosions, Contamination, Decontamination, Distribution, Dose limits, Earth atmosphere, Environment, Fallout, Fallout deposits, Fission products, Human populations, Plowshare project, Radiation doses, Radiation protection, Radioactivity, Reviews, Surface waters, Terrestrial ecosystems, Underground explosions.

For abstract, see NSA 29 12, number 29262.

LA-5137 PC$7.60/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
COUPLED NEUTRON–GAMMA MULTIGROUP–MULTITABLE CROSS SECTIONS FOR 29 MATERIALS PERTINENT TO NUCLEAR WEAPONS EFFECT CALCULATIONS GENERATED BY LASL/TD DIVISION.
H. A. Sandmeier, G. E. Hansen, R. E. Seamon, T. J. Hirons, and A. H. Marshall. Feb 74, 150p
Contract W-7405-eng-36

Descriptors: (*Hydrogen 1, *Neutron reactions), (*Deuterium, Neutron reactions), (*Tritium, Neutron reactions), (*Helium 3, Neutron reactions), Aluminium 27, Argon, Beryllium 9, Boron 10, Boron 11, Calcium, Carbon, Chlorine, Copper, Coupling, Cross sections, Energy losses, Gamma radiation, Group constants, Helium 4, Iron, Lead, Lithium 6, Lithium 7, Magnesium, Multigroup theory, Neutron transport, Neutrons, Nitrogen, Oxygen, Photon transport, Plutonium 239, Plutonium 240, Potassium, Silicon, Sodium 23, Tungsten, Uranium 235, Uranium 238.

For abstract, see NSA 29 12, number 31044.

NVO-103(Rev.4) PC$4.25/MF$1.45
Usaec Nevada Operations Office, Las Vegas.
REPORTS AVAILABLE IN THE ALASKAN INFORMATION PROGRAM.
Jan 74, 24p

Descriptors: (*Amchitka island area, *Bibliographies), (*Nuclear explosions, Bibliographies), (*Cannikin event, Bibliographies), (*Milrow event, Bibliographies), Ecology, Geology, Radiation hazards, Radiation monitoring, Radioactivity, Safety, Seismic waves, Seismology, Tsunamis, Underground explosions.

For abstract, see NSA 29 12, number 29263.

NVO-1163-244 PC$4.00/MF$1.45
Environmental Research Corp., Las Vegas, Nev. (Usa).
OBSERVED SEISMIC DATA, ALMENDRO EVENT.
Mar 74, 29p
Contract AT(29-2)-1163

Descriptors: (*Almendro event, *Ground motion), (*Seismic waves, *Wave propagation), Data, Geologic deposits, Nevada test site, Seismic detection.

For abstract, see NSA 29 12, number 29264.

PATENT-3 765 025 Not available NTIS
Department of the Air Force Washington D C
TIME DIFFERENTIATING PASSIVE IMPULSE GAGE.
Patent,
William A. Zietzke, and Alexander L. Florence.
Filed 11 Dec 72, patented 9 Oct 73, 5p Rept nos. PAT-APPL-314 053,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Gages, *Patents, Underground explosions, Nuclear explosions, Test equipment, Impulse loading.
Identifiers: PAT-CL-346-7.

The patent relates to a passive impulse gage, having a spring loaded mass responsive to impulses and extraneous loads in nuclear tests. It has a locking device to prevent reverse motion of the mass. A scribe mechanism has two spring loaded marking pins for marking a scribe plate. When the motion of the mass stops, the marking wheel is permitted to rotate to move one marking pin out of engagement with the scribe plate and to move the other marking pin into engagement with the scribe plate. Thus indication due to the test impulse is displaced on the scribe plate from indications due to extraneous loads.

UCRL-51554 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
ROCK MELT FROM AN UNDERGROUND NUCLEAR EXPLOSION.
T. R. Butkovich. 11 Mar 74, 11p
Contract W-7405-Eng-48

Descriptors: (*Nuclear explosions, Rocks), (*Rocks, *Melting), Density, Energy losses, Numerical solution, Porosity, Seismic waves, Underground explosions, Wave propagation.

For abstract, see NSA 29 12, number 29266.

18D. Nuclear Instrumentation

AD-780 432/1GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
ABSOLUTE CALIBRATION OF X-RAY IONIZATION CHAMBERS.
Interim rept.,
J. F. Meekins, A. E. Unzicker, K. P. Dere, and R. W. Kreplin. 8 May 74, 21p Rept no. NRL-7698

Descriptors: *Ionization chambers, *X rays, *Calibration, Proportional counters.

A method was devised to determine the response of ionization chambers to x radiation by direct measurement. The method was applied to several ionization chambers of the SOLRAD type. Resulting responses differed from those predicted. The standard of measurement employed was a proportional counter, which is described. (Author)

AERE-R-7494(2nd Ed.) PC$4.50/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
MODULAR SCHEME FOR INSTRUMENTATION SYSTEMS DEVELOPMENT.
D. Williams. Jan 74, 29p

Descriptors: (*Radiation detectors, *Counting circuits), Counting ratemeters, Data acquisition systems, Data processing, Digital systems, Memory devices, Pulse circuits.

For abstract, see NSA 29 12, number 29424.

BDX-613-1061 PC$4.50/MF$1.45
Bendix Corp., Kansas City, Mo. (Usa).
SPATIAL DISTRIBUTION FROM SMALL BETA SOURCES AND THE EFFECTS OF APERTURE SIZE. TECHNOLOGICAL SPINOFF REPORT.
R. V. Heckman. Feb 74, 28p
Contract AT(29-1)-613

Descriptors: (*Beta sources, *Spatial distribution), (*Thickness gages, *Miniaturization), Apertures, Backscattering, Radiometric gages.

For abstract, see NSA 29 12, number 29604.

BNWL-SA-4876 PC$3.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
COMPARISON OF GE(LI) AND ANTI-COMPTON SYSTEMS FOR MEASUREMENTS OF ENVIRONMENTAL SAMPLES.
N. A. Wogman. 1973, 25p CONF-731112-33

Descriptors: (*Gamma sources, *Radiometric analysis), (*Environment, *Radiation monitoring), Anticoincidence, Contamination, Gamma spectrometers, Li-drifted ge detectors, Low level counters, Radioisotopes, Solid scintillation detectors, Trace amounts.

For abstract, see NSA 29 12, number 29522.

CERN-74-6 PC$4.00/MF$1.45
European Organization for Nuclear Research, Geneva (Switzerland).
VERSATILE CABLE AND CONNECTOR ASSEMBLY TESTING APPARATUS (NP 2026).
K. Harrison. 4 Mar 74, 15p

Descriptors: (*Electric cables, *Electrical testing), (*Connectors, Electrical testing), (*Wire spark chambers, Electrical testing), Specifications.

For abstract, see NSA 29 12, number 29542.

EGG-1183-2278 PC$4.00/MF$1.45
Eg and G, Inc., Santa Barbara, Calif. (Usa).

LIGHT OUTPUT OF SEMICONDUCTOR LASER MATERIALS EXCITED BY A FLASH X-RAY MACHINE.
J. Stevens, J. F. Artuso, and Q. G. Klinger. Aug 72, 26p

Descriptors: (*Semiconductor lasers, *Radioluminescence), (*Cadmium sulfides, Radioluminescence), (*Zinc sulfides, Radioluminescence), (*Zinc oxides, Radioluminescence), Aluminates, Aluminium oxides, Dose rates, Selenides, Solid scintillation detectors, Timing properties, X radiation, Yttrium compounds, Zinc compounds.

For abstract, see NSA 29 12, number 29428.

LA-5523-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
LOW DEADTIME DELAY LINE READOUT FOR POSITION-SENSITIVE PROPORTIONAL COUNTERS.
A. N. Anderson, R. J. Barrett, and E. A. Wadlinger. Mar 74, 4p
Contract W-7405-eng-36

Descriptors: (*Multiwire proportional chambers, *Readout systems), Dead time, Delay circuits.

For abstract, see NSA 29 12, number 29442.

LA-tr-74-5 PC$4.25/MF$1.45
An Sssr, Moscow. Fiziko-Tekhnicheskij Inst.
DETERMINATION OF EFFICIENCY AND DIRECTIONAL RESPONSE OF COSMIC GAMMA-RADIATION DETECTORS.
S. V. Golenetskii, V. N. Il'inskii, and E. P. Mazets. Feb 74, 22p
Translation by H.J. Dahlby of FTI--455.

Descriptors: (*Gamma spectrometers, *Calibration), (*Cosmic ray spectrometers, *Solid scintillation detectors), Collimators, Cosmic radiation, Directional radiation detectors, Efficiency, Kosmos satellites.

For abstract, see NSA 29 12, number 29523.

LNF-73-56 PC$4.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
180 EXP 0 MAGNETIC SPECTROMETER WITH HELIUM FILLED STREAMER CHAMBER.
F. Balestra, R. Barbini, L. Busso, I. V. Falomkin, and R. Garfagnini. 27 Sep 73, 16p

Descriptors: (*Streamer spark chambers, *Performance), (*Magnetic spectrometers, Performance), Pion reactions, Scattering.

For abstract, see NSA 29 12, number 29543.

LNF-73-57 PC$4.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
REALIZATION AND SETTING UP OF A NEUTRON SPECTROMETER IN THE RANGE FROM 0.2 TO 12 MEV.
S. Merolli, and M. Roccella. 28 Sep 73, 7p

Descriptors: (*Neutron spectrometers, *Solid scintillation detectors), Efficiency, Kev range 100-1000, Mev range 10-100, Operation, Particle discrimination, Performance, Pulse discriminators, Stilbene.

For abstract, see NSA 29 12, number 29524.

RD/B/N-2696 PC$4.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
CRITICAL APPRAISAL OF THE PERFORMANCE OF THE FILM BADGE DOSIMETER IN SPECIALISED EXPERIMENTAL SITUATIONS.
M. W. Charles. Nov 73, 16p

Descriptors: (*Photographic film dosemeters, *Performance testing), (*Gamma dosimetry, Photographic film dosemeters), Dose rates, Heat exchangers, Thermoluminescent dosemeters.

For abstract, see NSA 29 12, number 29502.

RFP-2300 PC$4.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
SCALER MODULES FOR RADIATION DETECTION SYSTEMS.
B. E. Martin. 28 Mar 74, 17p
Contract AT(29-1)-1106

Descriptors: (*Radiation detectors, *Scalers), (*Solid scintillation detectors, Scalers), Counting circuits, Integrated circuits, Maintenance, Nuclear instrument modules, Operation.

For abstract, see NSA 29 12, number 29444.

RFP-2301 PC$4.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
TIMER MODULES FOR RADIATION DETECTION SYSTEMS.
B. E. Martin. 29 Mar 74, 18p
Contract AT(29-1)-1106

Descriptors: (*Radiation detectors, *Timing circuits), Integrated circuits, Maintenance, Nuclear instrument modules, Operation.

For abstract, see NSA 29 12, number 29445.

RL-73-153 PC$5.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
REPORT ON THE N.E.F. GROUP COATING PLANT.
P. Seager. Dec 73, 36p

Descriptors: (*Cryogenic bubble chambers, Optical systems), (*Optical systems, *Surface coating), Accelerator facilities, Laboratory equipment, Operation, Optical properties, Sputtering, Surface cleaning, Surface properties, Vapor deposited coatings.

For abstract, see NSA 29 12, number 29544.

RL-74-2 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
DOSIMETRY BY CHARGE DECAY OF POLYMER THERMOELECTRETS.
M. D. A. King. Dec 72, 20p

Descriptors: (*Dosemeters, Electrets), (*Electrets, *Personnel dosimetry), Decay, Electric charges, Mylar, Physical radiation effects, Polystyrene, Teflon.

For abstract, see NSA 29 12, number 29503.

RL-74-35 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
STUDY OF THE VARIATION OF THE NEON CONCENTRATION DURING AN EXPERIMENT WITH A TRACK SENSITIVE TARGET.
J. G. V. Guy, J. W. G. Wignall, and C. M. Fisher. 1974, 14p

Descriptors: Chemical composition, Cryogenic bubble chambers, Decay, Density, Distance, Hydrogen, Mixtures, Muons, Neon, Particle tracks, Pions plus, Quantity ratio, Range, Targets.

For abstract, see NSA 29 12, number 29545.

SSI-1974-10 PC$4.00/MF$1.45
Statens Straalskyddsinstitut, Stockholm (Sweden).
INSTRUMENT FOR MEASUREMENT OF LOW EXPOSURE RATES.
A. Baeckstroem, and J. C. Lindhe. Feb 74, 13p
In Swedish.

Descriptors: (*Exposure ratemeters, *Performance), (*Li-drifted si detectors, Exposure ratemeters), Accuracy, Calibration, Dimensions, Energy dependence, Gynecology, Lifetime, Radiation effects.

For abstract, see NSA 29 12, number 29446.

SZS-151 PC$5.00/MF$1.45
Staatliche Zentrale fuer Strahlenschutz, Berlin (German Democratic Republic).
PROPERTIES OF PORTABLE, BATTERY-OPERATED RADIATION PROTECTION INSTRUMENTS PRODUCED IN SOCIALIST COUNTRIES.
W. Kraus, D. Herrmann, K. P. Schaup, K. Helmstaedter, and O. Hecker. Jun 73, 39p
In German.

Descriptors: (*Radiation monitors, *Specifications), (*Surface contamination monitors, Specifications), (*Liquid contamination monitors, Specifications), Alpha detection, Beta detection, Dose ratemeters, Dosemeters, Gamma detection, Neutron detection, Performance, X-ray detection.

For abstract, see NSA 29 12, number 29447.

UH-511-161-73 PC$6.00/MF$1.45
Hawaii Univ., Honolulu (Usa). Dept. Of Physics.
BUBBLE CHAMBER SCANNING AND LIBRARY SYSTEM FOR THE UNIVERSITY OF HAWAII HIGH ENERGY PHYSICS GROUP.
J. Jerome, W. Roseman, and P. Wohlmut. 12 Dec 68, 78p
Contract AT(04-3)-511

Descriptors: (*Bubble chambers, *Data processing), (*Computer codes, *B codes), Image scanners, Particle tracks, Photographic films.

For abstract, see NSA 29 12, number 29546.

ZFK-242 PC$4.00/MF$1.45
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
INTERPRETATION OF THE MEASURING VALUE OF MODERATOR SPHERE DOSIMETERS AS THE NEUTRON DOSE EQUIVALENT IN THE BODY SURFACE.
W. Rossbander, and B. Adler. Nov 72, 9p
In German.

Descriptors: (*Moderating detectors, *Neutron dosimetry), Dose equivalents, Phantoms, Stray radiation, Surfaces.

For abstract, see NSA 29 12, number 29505.

18E. Nuclear Power Plants

AE-484 PC$5.50/MF$1.45
Aktiebolaget Atomenergi, Studsvik (Sweden).
NEUTRON RADIOGRAPHY AT THE STUDSVIK R2-0 REACTOR.
I. Gustafsson, and E. Sokolowski. Jan 74, 46p

Descriptors: (*R-2 reactor, *Neutron radiography), Configuration, Performance, Reactor experimental facilities, Specifications.

For abstract, see NSA 29 12, number 31243.

AECL-4364 PC$5.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
URANIUM BOOSTER ROD EXPERIMENTS IN ZED-2. PART II. INITIAL CONVERSION AND

FAST FISSION RATIO MEASUREMENTS FOR A 20% ENRICHED URANIUM BOOSTER ROD.
S. L. Mehta, and P. M. French. Dec 73, 43p

Descriptors: (*Zed-2 reactor, *Reactor kinetics), Booster rods, Conversion ratio, Fast fission, Fission ratio, Moderately enriched uranium.

For abstract, see NSA 29 12, number 31244.

AECL-4709 PC$4.00/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
WHY CANDU. ITS ACHIEVEMENTS AND PROSPECTS.
J. L. Gray. Jan 74, 18p

Descriptors: (*Phwr type reactors, *Performance), (*Canada, *Nuclear power), Economics, Fuel cycle, Planning, Pressure tubes.

For abstract, see NSA 29 12, number 31197.

AERE-R-7611 PC$4.50/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
SOME FURTHER DEVELOPMENTS IN THE PREVIOUSLY DERIVED ANALYTICAL MODEL FOR CALCULATING STRESSES AND STRAIN RATES IN THE COATINGS OF HTR FUEL PARTICLES.
D. G. Martin. Feb 74, 26p

Descriptors: (*Htgr type reactors, Coated fuel particles), (*Coated fuel particles, *Stress analysis), Coatings, Creep, Dimensions, Elasticity, Layers, Mathematical models, Neutron beams, Physical radiation effects, Pyrolytic carbon, Strains, Stresses.

For abstract, see NSA 29 12, number 31170.

ANCR-1129 PC$10.60/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
NUCLEAR TECHNOLOGY DIVISION ANNUAL PROGRESS REPORT FOR PERIOD ENDING JUNE 30, 1973.
Dec 73, 410p
Contract AT(10-1)-1375

Descriptors: (*Nuclear properties, *Research programs), (*Reactors, *Planning), Design, Geothermal energy, Geothermal power plants, Leading abstract.

For abstract, see NSA 29 12, number 31245.

ANCR-1144 PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
EXPERIMENT DATA REPORT FOR 1-1/2-LOOP SEMISCALE SYSTEM ISOTHERMAL TESTS 1004 AND 1006.
R. S. Alder, E. M. Feldman, and P. A. Pinson. Mar 74, 88p
Contract AT(10-1)-1375

Descriptors: (*Pwr type reactors, Eccs), (*Eccs, *Performance testing), Blowdown, Flow rate, Heat transfer, Liquid flow, Loss of coolant, Mockup, Reactor safety, Specifications, Stimulation.

For abstract, see NSA 29 12, number 31155.

ANCR-1145 PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
EXPERIMENT DATA REPORT FOR 1-1/2-LOOP SEMISCALE SYSTEM ISOTHERMAL TESTS 1008 AND 1010.
R. S. Alder, E. M. Feldman, and P. A. Pinson. Mar 74, 75p
Contract AT(10-1)-1375

Descriptors: (*Pwr type reactors, Eccs), (*Eccs, *Performance testing), Flow rate, Liquid flow, Loss of coolant, Mockup, Reactor safety, Simulation.

For abstract, see NSA 29 12, number 31156.

BNWL-B-339 PC$4.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
ELECTROMAGNETIC SELF-EXCITATION EFFECTS IN LIQUID METAL COOLED REACTORS.
D. L. Lessor. Dec 73, 23p

Descriptors: (*Lmfbr type reactors, Reactor cooling systems), (*Reactor cooling systems, *Electromagnetic fields), Configuration, Fbr type reactors, Liquid flow, Liquid metals.

For abstract, see NSA 29 12, number 31207.

BNWL-B-341 PC$6.50/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
PRELIMINARY SAFETY ANALYSIS REPORT FOR THE PNL NEUTRON MULTIPLIER FACILITY.
R. J. Hall, and H. G. Jr. Rieck. Jan 74, 68p
Contract AT(45-1)-1830

Descriptors: (*Neutron sources, *Design), (*Subcritical assemblies, Design), (*Thermal neutrons, *Production), Californium 252, Enriched uranium, Fission products, Fissionable materials, Irradiation devices, Operation, Personnel, Radiation hazards, Radiation monitoring, Radiation protection, Safety, Shielding.

For abstract, see NSA 29 12, number 31251.

BNWL-1804 PC$5.45/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
EXPERIMENTAL STUDY OF AXIAL AND CROSSFLOW VELOCITY IN A 7-PIN WIRE WRAPPED BUNDLE.
C. L. Wheeler, D. S. Rowe, and J. D. Smith. 4 Feb 74, 74p
Contract AT(45-1)-1830

Descriptors: (*Lmfbr type reactors, Fuel element clusters), (*Fftf reactor, Fuel element clusters), (*Fuel element clusters, *Fluid flow), Computer calculations, Mixing, Spacers, Wires.

For abstract, see NSA 29 12, number 31206.

CEA-CONF-2544 PC$3.00/MF$1.45
Electricite de France, 75 - Paris.
TRAPPING AND DESORPTION OF IODINE IN GRAPHITE-GAS REACTORS.
J. Barbier, G. Benezech, B. Cadet, J. Miribel, and P. Sigli. 1973, 16p CONF-730907-17
In French.

Descriptors: (*Gcr type reactors, Primary coolant circuits), (*Primary coolant circuits, *Iodine), Adsorption, Chemical state, Chinon-1 reactor, Desorption, Iodine 131.

For abstract, see NSA 29 12, number 31171.

CEA-CONF-2546 PC$3.75/MF$1.45
Cea Centre d'Etudes Nucleaires de Saclay, 91 - Gif-sur-Yvette (France).
COATED PARTICLE FUEL ELEMENT GBR 3: DESIGN AND FABRICATION PROBLEMS.
R. Bujas, and C. Ringot. 1973, 35p CONF-731065-1
In French.

Descriptors: (*Gcfr type reactors, Fuel elements), (*Fuel elements, *Fabrication), Coated fuel particles, Design.

For abstract, see NSA 29 12, number 31208.

CONF-730910-10 PC$4.00/MF$1.45
Westinghouse Electric Corp., Madison, PA. (Usa). Advanced Reactors Div.
EXPERIMENTAL GRID-TYPE SUBASSEMBLIES FOR IRRADIATION IN EBR-II.
P. J. Levine, and A. L. Schwallie. 2p
Contract AT(11-1)-3045

Descriptors: (*Lmfbr type reactors, Fuel assemblies), (*Fftf reactor, Fuel assemblies), (*Fuel assemblies, Spacers), (*Spacers, *Performance testing), Configuration, Fbr type reactors, Fuel pins, Heat transfer, Liquid flow, Mockup, Simulation, Stresses.

For abstract, see NSA 29 12, number 31216.

DOCKET-STN-50480-1 PC$20.50/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Pwr Systems Div.
WESTINGHOUSE NUCLEAR ENERGY SYSTEMS. RESAR 41, RSAR, VOLUME I.
7 Mar 74, 347p

Descriptors: Blowdown, Control rod drives, Design, Environment, Floods, Fuel assemblies, Fuel densification, Mechanical structures, Mechanical vibrations, Pipelines, Pwr/41 type reactors, Reactor accidents, Reactor components, Reactor control systems, Reactor fueling, Reactor instrumentation, Reactor sites, Ruptures, Seismic effects, Standards, Steam generators, Tornadoes, Wind.

For abstract, see NSA 29 12, number 31433.

DOCKET-50206-271 PC$3.50/MF$1.45
Southern California Edison CO., Rosemead (Usa).
SAN ONOFRE NUCLEAR GENERATING STATION, UNIT 1. SEMI-ANNUAL OPERATING REPORT NO. 13, JULY 1, 1973 TO DECEMBER 31, 1973.
25 Feb 74, 30p

Descriptors: (*San onofre-1 reactor, *Environment), Design, Electric power, Failures, Leaks, Personnel, Pressurizers, Radiation doses, Radiation monitoring, Radioactive waste disposal, Reactor maintenance, Reactor operation, Reactor shutdown, Turbines, Valves.

For abstract, see NSA 29 12, number 31430.

DOCKET-50237-486 PC$9.50/MF$1.45
Commonwealth Edison CO., Chicago, Ill. (Usa).
DRESDEN NUCLEAR POWER STATION, UNITS 2 AND 3. SPECIAL REPORT NO. 37, ANALYSIS OF EFFECTS OF PIPE BREAK OUTSIDE OF THE PRIMARY CONTAINMENT, SUPPLEMENT 1.
22 Mar 74, 128p DOCKET-50249-376

Descriptors: (*Dresden-2 reactor, *Reactor accidents), (*Dresden-3 reactor, Reactor accidents), Pipelines, Ruptures.

For abstract, see NSA 29 12, number 31431.

DOCKET-50263-339 PC$7.50/MF$1.45
Northern States Power CO., Minneapolis, Minn. (Usa).
MONTICELLO NUCLEAR GENERATING PLANT, UNIT 1. SIX-MONTH OPERATING REPORT NO. 6, JULY--DECEMBER 1973.
28 Feb 74, 89p

Descriptors: (*Monticello reactor, *Environment), Electric power, Radiation monitoring, Radioactive wastes, Reactor maintenance, Reactor operation, Reactor shutdown, Testing.

For abstract, see NSA 29 12, number 31146.

DOCKET-50266-144 PC$6.25/MF$1.45
Wisconsin Electric Power CO., Milwaukee (Usa).

POINT BEACH NUCLEAR PLANT, UNITS 1 AND 2. SEMI-ANNUAL OPERATION REPORT NO. 7, JULY 1, 1973--DECEMBER 31, 1973.
1 Mar 74, 84p DOCKET-50301-132

Descriptors: (*Point beach-1 reactor, *Environment), (*Point beach-2 reactor, Environment), Chemistry, Electric power, Monitoring, Radiation protection, Reactor instrumentation, Reactor maintenance, Reactor operation, Reactor safety, Testing, Turbines, Valves.

For abstract, see NSA 29 12, number 31160.

DOCKET-50267-123 PC$6.75/MF$1.45
Public Service CO. Of Colorado, Denver (Usa).
FORT ST. VRAIN NUCLEAR GENERATING STATION. ENVIRONMENTAL RADIATION SURVEILLANCE PROGRAM FOR THE PERIOD JULY--DECEMBER 1973.
21 Mar 74, 75p

Descriptors: (*Vrain reactor, *Environment), Algae, Alpha particles, Aquatic ecosystems, Atmospheric precipitations, Beta particles, Cattle, Cesium 137, Gamma radiation, Iodine 131, Milk, Potassium 40, Radiation monitoring, Rivers, Sampling, Sediments, Temperature measurement.

For abstract, see NSA 29 12, number 31187.

DOCKET-50293-263 PC$5.75/MF$1.45
Boston Edison CO., Mass. (Usa).
PILGRIM NUCLEAR POWER STATION, UNIT 1. THIRD SEMIANNUAL OPERATING AND MAINTENANCE REPORT, JULY 1, 1973--DECEMBER 31, 1973.
1 Apr 74, 53p

Descriptors: (*Pilgrim-1 reactor, *Personnel), Radiation doses, Radioactive wastes, Reactor maintenance, Reactor operation.

For abstract, see NSA 29 12, number 31432.

EIR-250 PC$3.00/MF$1.45
Eidgenoessisches Inst. Fuer Reaktorforschung, Wuerenlingen (Switzerland).
BINARY CYCLES FOR A HIGH TEMPERATURE GAS-COOLED REACTOR WITH HELIUM TURBINE.
G. Markoczy. Jan 74, 19p

Descriptors: (*Htgr type reactors, *Thermodynamic cycles), Efficiency, Gas turbines, Helium, Turbogenerators.

For abstract, see NSA 29 12, number 31188.

EIR-253 PC$3.00/MF$1.45
Eidgenoessisches Inst. Fuer Reaktorforschung, Wuerenlingen (Switzerland).
THORIUM--URANIUM FAST/THERMAL BREEDING SYSTEM WITH MOLTEN SALT FUEL.
M. Taube. Feb 74, 14p

Descriptors: (*Fbr type reactors, *Fuel cycle), (*Thermal reactors, Fuel cycle), (*Molten salt fueled reactors, Fuel cycle), Efficiency, Nuclear materials management, Reactor safety, Reprocessing.

For abstract, see NSA 29 12, number 31217.

EUR-5044 PC$3.50/MF$1.45
Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
COOLANT VOID EXPERIMENTS IN ECG IN 19 ROD U AND U--PU FUEL CLUSTERS.
W. Hage, H. Hettinger, H. Hohmann, F. Tinagli, and F. Toselli. 1974, 29p

Descriptors: (*Eco reactor, Fuel assemblies), (*Fuel assemblies, *Temperature coefficient), Configuration, Critical size, Fuel rods, Plutonium, Reactor cores, Testing.

For abstract, see NSA 29 12, number 31253.

EUR-5072 PC$7.50/MF$1.45
Kernkraftwerk Obrigheim G.M.B.H., Obrigheim/Mosbach (F.R. Germany).
OBRIGHEIM NUCLEAR POWER PLANT. ANNUAL REPORT, 1972.
1974, 88p
In German.

Descriptors: (*Obrigheim reactor, *Reactor operation), Performance, Personnel, Radiation doses, Reactor maintenance.

For abstract, see NSA 29 12, number 31161.

EUR-5074 PC$7.75/MF$1.45
Kernkraftwerk Rwe-Bayernwerk G.M.B.H., Gundremmingen/Guenzburg (F.R. Germany).
GUNDREMMINGEN (KRB) NUCLEAR POWER PLANT. ANNUAL REPORT, 1972.
1974, 95p
Contract 005-63-4 REPD
In German.

Descriptors: (*Rwe-bayernwerk reactor, *Reactor operation), Personnel monitoring, Radiation doses, Reactor maintenance.

For abstract, see NSA 29 12, number 31147.

EUR-5081 PC$6.00/MF$1.45
Commission of the European Communities, Ispra (Italy). Joint Nuclear Research Center.
TEMPERATURE COEFFICIENT MEASUREMENTS IN ECO WITH PU-CONTAINING ONE AND THREE ROD FUEL ELEMENTS.
W. Hage, H. Hettinger, H. Hohmann, F. Toselli, and J. Schneider. 1974, 60p

Descriptors: (*Eco reactor, Fuel assemblies), (*Fuel assemblies, *Temperature coefficient), Configuration, Fuel rods, Plutonium, Testing.

For abstract, see NSA 29 12, number 31254.

EURFNR-1115 PC$17.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany).
FAST BREEDER PROJECT. SECOND QUARTERLY REPORT, APRIL 1--JUNE 30, 1973.
1973, 303p KFK-1273/2

Descriptors: (*Lmfbr type reactors, *Research programs), Fuel cycle, Fuel pins, Materials testing, Reactor kinetics, Reactor materials, Reactor safety, Sodium.

For abstract, see NSA 29 12, number 31218.

FIND-50275 PC$4.00/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
FIND: DIABLO CANYON NUCLEAR POWER PLANT, UNITS 1 AND 2. ITEMS 1-74.
W. H. Williams. Apr 74, 21p

Descriptors: (*Diablo canyon-1 reactor, *Reactor licensing), (*Diablo canyon-2 reactor, Reactor licensing), Indexes, Reactor safety.

For abstract, see NSA 29 12, number 31434.

FIND-50302 PC$4.00/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
FIND: CRYSTAL RIVER NUCLEAR GENERATING PLANT, UNITS 3 AND 4. ITEMS 1--116.
Mar 74, 35p

Descriptors: (*Crystal river-3 reactor, *Reactor licensing), (*Crystal river-4 reactor, Reactor licensing), Indexes, Reactor safety.

For abstract, see NSA 29 12, number 31435.

FIND-50334 PC$4.00/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
FIND: BEAVER VALLEY POWER STATION, UNIT 1. ITEMS 1-102.
E. P. Carter. Mar 74, 37p

Descriptors: (*Beaver valley-1 reactor, *Reactor licensing), Indexes, Reactor safety.

For abstract, see NSA 29 12, number 31436.

FIND-50440 PC$4.00/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
FIND: PERRY NUCLEAR POWER PLANT, UNITS 1 AND 2. ITEMS 1-51.
W. H. Williams. Mar 74, 34p

Descriptors: (*Perry-1 reactor, *Reactor licensing), (*Perry-2 reactor, Reactor licensing), Indexes, Reactor safety.

For abstract, see NSA 29 12, number 31437.

GA-A-12628(Rev.) PC$3.50/MF$1.45
General Atomic CO., San Diego, Calif. (Usa).
DESIGN AND PERFORMANCE OF COATED PARTICLE FUELS FOR THE THORIUM CYCLE HTGR.
T. D. Gulden, D. P. Harmon, and O. M. Stansfield.
24 Jan 74, 28p CONF-730912-4
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, Coated fuel particles), (*Coated fuel particles, *Performance), Physical radiation effects, Specifications, Stresses, Thorium oxides, Uranium carbides.

For abstract, see NSA 29 12, number 31189.

GEAP-12466 PC$4.00/MF$1.45
General Electric CO., Pleasanton, Calif. (Usa). Vallecitos Nuclear Center.
THERMODYNAMIC DATA PROGRAM INVOLVING PLUTONIA AND URANIA AT HIGH TEMPERATURES. QUARTERLY REPORT NO. 25, AUGUST 1, 1973--NOVEMBER 1, 1973.
E. A. Aitken, D. Dutina, M. G. Adamson, S. K. Evans, and T. E. Ludlow. Dec 73, 12p
Contract AT(04-3)-893

Descriptors: (*Lmfbr type reactors, *Fuel elements), (*Stainless steel-316, *Intergranular corrosion), Fuel cans, Plutonium oxides, Uranium dioxide, Carbon, Cesium, Fission products, Fuel-cladding interactions, Tellurium, Chemical reactions, Fuel-coolant interactions, Sodium.

For abstract, see NSA 29 12, number 31219.

GU-5304 PC$4.50/MF$1.45
Gulf United Nuclear Fuels Corp., Elmsford, N.Y. (Usa).
DRESDEN 1 PLUTONIUM RECYCLE PROGRAM. SEMIANNUAL REPORT FOR PERIOD ENDING JUNE 30, 1973.
T. L. Krysinski, and M. Wan. Jul 73, 49p
Contract AT(11-1)-2210

Descriptors: (*Dresden-1 reactor, *Fuel assemblies), Burnup, In core instruments, Performance, Plutonium oxides, Power density, Reactor instrumentation, Reactor operation, Uranium dioxide.

For abstract, see NSA 29 12, number 31148.

GULF-EL-A-12426 PC$3.00/MF$1.45
Gulf Electronic Systems, San Diego, Calif. (Usa).

COMPUTER-CONTROLLED REFUELING MACHINE AT FORT ST. VRAIN.
C. W. Smith, and F. Mathie. 6 Dec 72, 15p CONF-721202-20
Contract AT(04-3)-633

Descriptors: (*Vrain reactor, *Reactor charging machines), Computers, Control systems, Specifications.

For abstract, see NSA 29 12, number 31191.

GULF-GA-A-12244 PC$3.75/MF$1.45
Gulf General Atomic CO., San Diego, Calif. (Usa).
PREOPERATIONAL AND STARTUP TESTING EXPERIENCE AT FORT ST. VRAIN NUCLEAR GENERATING STATION.
F. E. Swart, and M. E. Kantor. Sep 72, 32p CONF-7209110-1
Contract AT(04-3)-633

Descriptors: (*Vrain reactor, *Testing), Reactor start-up, Specifications.

For abstract, see NSA 29 12, number 31192.

GULF-GA-A-12651 PC$4.00/MF$1.45
Gulf General Atomic CO., San Diego, Calif. (Usa).
HTGR GAS TURBINE POWER PLANT CONFIGURATION STUDIES.
R. G. Adams, F. R. Bell, C. F. McDonald, and D. C. Morse. 26 Jul 73, 37p CONF-731105-10
Contract AT(04-3)-167

Descriptors: (*Htgr type reactors, Heat exchangers), (*Turbogenerators, *Configuration), (*Heat exchangers, Configuration), Gas turbines, Helium, Specifications.

For abstract, see NSA 29 12, number 31193.

HEDL-SA-646 PC$3.00/MF$1.45
Wadco Corp., Richland, Wash. (Usa).
DYNAMICS OF MOLTEN FUEL MOTION DURING A FAST REACTOR OVERPOWER TRANSIENT.
H. J. Willenberg, W. L. Partain, and A. E. Waltar. 1973, 21p CONF-740401-2

Descriptors: (*Lmfbr type reactors, Meltdown), (*Meltdown, *Liquid flow), Failures, Fbr type reactors, Fuel cans, Fuel pins, Reactivity worths, Reactor safety, Transients.

For abstract, see NSA 29 12, number 31221.

IS-T-628 PC$6.75/MF$1.45
Ames Lab., Iowa (Usa).
APPLICATION OF MONTE CARLO CRITICALITY CALCULATIONS TO THE AMES LABORATORY RESEARCH REACTOR.
D. L. Hull. Apr 74, 72p
Contract W-7405-eng-82

Descriptors: (*Airr reactor, *Criticality), Comparative evaluations, Computer codes, K codes, Monte carlo method, Reactivity, Reactor cores.

For abstract, see NSA 29 12, number 31258.

JUL-1031-RG PC$6.25/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorentwicklung.
NOISE ANALYSIS AT ITR (INCORE-THERMIONIC-REACTOR) DETERMINATION OF BETA /1 AND POWER DETERMINATION USING THE FORMFACTOR.
V. Malka, H. Brixy, and R. Hecker. Dec 73, 65p
In German.

Descriptors: (*Itr reactor, *Delayed neutron fraction), Neutron flux, Power density, Reactor noise.

For abstract, see NSA 29 12, number 31260.

JUL-1044-RG PC$12.25/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Reaktorentwicklung.
MEASUREMENT OF THE GAS-OUTLET-TEMPERATURES AND THE FLOW BEHAVIOR OF SPHERES IN THE FLOWING CORE OF A PEBBLE-BED REACTOR WITH A NEW DEVELOPED MEASURING SYSTEM.
M. N. Ramadan. Feb 74, 182p
In German.

Descriptors: (*Avr reactor, *Fuel spheres), Coolants, Flow rate, Fuel elements, Reactor cores, Spheres, Temperature measurement.

For abstract, see NSA 29 12, number 31194.

KFK-1273-3 PC$11.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany).
FAST BREEDER PROJECT. THIRD QUARTERLY REPORT, 1973.
R. Hueper. Dec 73, 168p EUR-4971-d
In German.

Descriptors: (*Lmfbr type reactors, *Research programs), (*Snr reactor, *Fuel elements), Fbr type reactors, German federal republic, Reactor kinetics, Reactor materials, Reactor safety.

For abstract, see NSA 29 12, number 31231.

KFK-1705 PC$12.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Abt. Reaktorbetrieb und Technik.
REPORT ON THE OPERATION IN 1971 OF THE RESEARCH REACTOR FR2.
W. Steiger, and I. Moeller. Nov 73, 186p
In German.

Descriptors: (*Fr-2 reactor, *Reactor operation), Availability, Performance, Reactor maintenance, Research programs.

For abstract, see NSA 29 12, number 31261.

KFK-1814 PC$10.75/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Material- und Festkoerperforschung.
DESIGN, IRRADIATION, AND EXAMINATION OF THE UO SUB 2 --PUO SUB 2 FUEL PINS IN THE TEST DFR-304.
K. Kummerer, and D. Geithoff. Jan 74, 151p
In German.

Descriptors: (*Fbr type reactors, Fuel pins), (*Fuel pins, *Testing), Burnup, Design, Dfr reactor, Irradiation, Plutonium oxides, Uranium dioxide.

For abstract, see NSA 29 12, number 31232.

KFK-1880 PC$9.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Neutronenphysik und Reaktortechnik.
CALCULATION OF NEUTRON FLUX IN OUTER CORE AND BLANKET REGIONS OF FAST REACTORS.
M. Lalovic. Nov 73, 125p
In German.

Descriptors: (*Lmfbr type reactors, *Neutron flux), Breeding blankets, Carlson method, Group constants, Neutron diffusion equation, Neutron transport theory, Reactor cores.

For abstract, see NSA 29 12, number 31233.

KFK-1914 PC$9.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Reaktorentwicklung.
SODIUM EXPERIMENTS RELATED TO LOCAL BLOCKAGES IN FAST REACTOR SUBASSEMBLIES.
K. Schleisiek. Feb 74, 129p
In German.

Descriptors: (*Snr reactor, Fuel assemblies), (*Lmfbr type reactors, Fuel assemblies), (*Fuel assemblies, *Flow blockage), Comparative evaluations, Fbr type reactors, Heat transfer, Liquid flow, Mockup, Reactor cores, Reactor safety, Simulation.

For abstract, see NSA 29 12, number 31234.

LA-UR-74-213 PC$3.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
HIGH-TEMPERATURE NUCLEAR REACTORS AS AN ENERGY SOURCE FOR HYDROGEN PRODUCTION.
J. D. Balcomb, and L. A. Booth. 1974, 7p CONF-740306-6
Contract W-7405-eng-36

Descriptors: (*Htgr type reactors, *Planning), (*Hydrogen, *Production), Heat exchangers, Process heat reactors.

For abstract, see NSA 29 12, number 31195.

LA-UR-74-520 PC$4.25/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa); Argonne National Lab., Ill. (Usa).
RECRITICALITY CONSIDERATIONS IN LMFBR ACCIDENTS.
J. E. Boudreau, and J. F. Jackson. 1974, 25p CONF-740401-3

Descriptors: (*Lmfbr type reactors, *Reactor core disruption), Criticality, Excursions, Fbr type reactors, Reactor safety.

For abstract, see NSA 29 12, number 31235.

PWAC-324 PC$19.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
PRELIMINARY HAZARDS REPORT FOR A REACTOR EXPERIMENT AT NRTS, JULY 1966.
C. C. Bigelow, D. T. Hedden, and E. C. Crume. 1 Apr 61, 321p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Radiation hazards), (*Test reactors, Radiation hazards), Configuration, Reactor operation, Reactor safety.

For abstract, see NSA 29 12, number 31264.

PWAC-341 PC$10.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
CANEL INPILE FORCED CONVECTION LOOP PROGRAM SUMMATION REPORT.
A. M. Fine. 30 Jun 61, 148p
Contract AT(11-1)-229

Descriptors: (*Etr reactor, *In pile loops), (*Aircraft propulsion reactors, Fuel elements), (*Fuel elements, *Performance testing), Configuration, Fabrication, Specifications.

For abstract, see NSA 29 12, number 31265.

RD/B/N-2837 PC$5.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
BUBBLING FROM LMFBR FUEL FAILURES AND ITS RELEVANCE TO FAILED FUEL LOCATION.
M. V. Polley. Nov 73, 37p

Descriptors: (*Lmfbr type reactors, *Failed element detection), Bubble growth, Bubbles, Defects, Fission products, Fuel pins, Gases, Leaks, Liquid flow, Size, Sodium, Voids.

For abstract, see NSA 29 12, number 31238.

RD/B/N-2882 PC$4.50/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
MODEL FOR PREDICTING THE BULK ARRIVAL RATE OF PARTICULATE ON A.G.R. FUEL PIN SURFACES.
M. W. Reeks. Dec 73, 26p

Descriptors: (*Agr type reactors, Fuel pins), (*Fuel pins, *Deposits), Annular space, Boundary layers, Deposition, Diffusion, Fins, Gas flow, Mass transfer, Particles, Stochastic processes, Surfaces.

For abstract, see NSA 29 12, number 31196.

SLA-73-998 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
SANDIA PULSED REACTOR III (SPR III): PROTECTION-SYSTEM DESIGN BASIS.
L. L. Bonzon, and J. S. Philbin. Mar 74, 27p
Contract AT(29-1)-789

Descriptors: (*Spr-3 reactor, *Reactor operation), Reactor protection systems, Reactor safety, Specifications.

For abstract, see NSA 29 12, number 31266.

SLA-74-5144 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
REACTOR KINETICS: PULSE AND STEADY-STATE.
B. F. Estes, and F. M. Morris. Apr 74, 16p CONF-740206-3

Descriptors: (*Acpr reactor, *Reactor kinetics), Fuel elements, Heat transfer, Mathematical models, Reactor cores, Temperature distribution.

For abstract, see NSA 29 12, number 31267.

SRARI-P-199 PC$4.50/MF$1.45
Nauchno-Issledovatel'Skij Inst. Atomnykh Reaktorov, Dimitrovgrad (Ussr).
REVIEW OF THE BASIC RESULTS OF THE STUDY OF THE STATE OF STANDARD FUEL ELEMENTS OF WATER-COOLED POWER REACTORS.
S. N. Votinov, V. S. Belokolytov, E. F. Davydov, A. A. Mayershin, and Z. I. Pakhomov. 1973, 28p
In Russian.

Descriptors: (*Bwr type reactors, Fuel cans), (*Pwr type reactors, Fuel cans), (*Fuel elements, *Performance), (*Fuel cans, Performance), Failures, Mechanical properties, Physical radiation effects.

For abstract, see NSA 29 12, number 31151.

TID-26543 PC$5.50/MF$1.45
Southwest Research Inst., San Antonio, Tex. (Usa).
FIFTH MECHANIZED ULTRASONIC INVESTIGATION OF A LAMINAR INDICATION IN THE PLACE OF THE LACROSSE BOILING WATER REACTOR PRESSURE VESSEL. TOPICAL REPORT NO. 15.
Sep 73, 48p
Contract AT(11-1)-2154

Descriptors: (*Lacbwr reactor, *Pressure vessels), Defects, Inspection, Ultrasonic testing.

For abstract, see NSA 29 12, number 31152.

WASH-1101(2nd Ed.) PC$7.60/MF$1.45
Argonne National Lab., Ill. (Usa).
LMFBR: LIQUID METAL FAST BREEDER REACTOR PROGRAM PLAN. ELEMENT 1. OVERALL PLAN.
Dec 73, 145p

Descriptors: (*Lmfbr type reactors, *Planning), (*Usa, Lmfbr type reactors), Fbr type reactors.

For abstract, see NSA 29 12, number 31240.

WASH-1203-73 PC$5.45/MF$1.45
Usaec Division of Reactor Development and Technology, Washington, D.C.
OPERATING HISTORY OF U.S. NUCLEAR POWER REACTORS.
1973, 83p

Descriptors: (*Nuclear power plants, *Availability), (*Usa, Nuclear power plants), Data, Reactor operation.

For abstract, see NSA 29 12, number 31153.

WCAP-3385-37 PC$4.00/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Nuclear Fuel Div.
SAXTON PLUTONIUM PROJECT QUARTERLY PROGRESS REPORT FOR THE PERIOD ENDING SEPT. 30, 1973.
H. H. Crain. Dec 73, 50p

Descriptors: (*Saxton reactor, *Burnup), (*Plutonium, *Fuel cycle), (*Pwr type reactors, Fuel cycle), Fuel elements, Performance testing.

For abstract, see NSA 29 12, number 31162.

ZFK-244 PC$4.50/MF$1.45
Zentralinstitut fuer Kernforschung, Rossendorf bei Dresden (German Democratic Republic).
EVALUATION OF RESEARCH REACTOR SAFETY ON THE BASIS OF STATISTICAL TREATMENT OF LITERATURE INFORMATION. I. DENSITY DISTRIBUTIONS OF THE EXCESS REACTIVITY AND SHUTDOWN MARGIN AS A FUNCTION OF THE REACTOR POWER.
B. Adler, and T. Kampf. Feb 73, 26p
In German.

Descrintors: (*Research reactors, *Reactivity), Power density, Reactor safety, Reactor shutdown, Spatial distribution.

For abstract, see NSA 29 12, number 31271.

18F. Radiation Shielding and Protection

GEMP-518 PC$4.25/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
RECENT DEVELOPMENTS IN METALLIC HYDRIDE SHIELDING MATERIALS.
R. Van Houten. 22 May 67, 41p

Descriptors: (*Titanium hydrides, *Fabrication), (*Boron compounds, Fabrication), (*Zirconium compounds, Fabrication), (*Radiation effects, Fabrication), Shielding materials, Thorium hydrides, Yttrium hydrides.

For abstract, see NSA 29 12, number 29985.

RFP-1867(Rev.1) PC$4.00/MF$1.45
Dow Chemical U.S.a., Golden, Colo. Rocky Flats Div.
ROCKY FLATS MODEL 2030-1 CONTAINER (AEC--AL USA/5332/BLF) SAFETY ANALYSIS REPORT FOR PACKAGING (SARP).
F. E. Adcock, J. D. McCarthy, and W. F. Wackler. 27 Feb 74, 26p
Contract AT(29-1)-1106

Descriptors: (*Casks, *Safety), (*Uranium 235, *Transport), (*Plutonium, Transport), Enriched uranium.

For abstract, see NSA 29 12, number 30208.

SLA-73-1026 PC$4.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
TIGER: A ONE-DIMENSIONAL, MULTILAYER ELECTRON/PHOTON MONTE CARLO TRANSPORT CODE.
J. A. Sr. Halbleib, and W. H. Vandevender. Mar 74, 27p
Contract AT(29-1)-789

Descriptors: (*Computer codes, *T codes), (*Photon transport, Computer codes), (*Electrons, *Transmission), Charged-particle transport, Geometry, Kev range 01-10, Layers, Monte carlo method, One-dimensional calculations, Photons, Transport theory.

For abstract, see NSA 29 12, number 31045.

TID-26551 PC$5.75/MF$1.45
Battelle Columbus Labs., Ohio (Usa).
ENGINEERING ANALYSIS REPORT OF THE DESIGN OF THE F-144-1 SHIPPING CONTAINER TO E. I. DU PONT DE NEMOURS AND COMPANY.
E. C. Lusk, and R. J. Burian. 22 Sep 72, 52p

Descriptors: (*Casks, *Design), (*Fuel assemblies, *Transport), (*Fftf reactor, Fuel assemblies).

For abstract, see NSA 29 12, number 30209.

18G. Radioactive Wastes and Fission Products

BNL-18731 PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
SAVANNAH RIVER LABORATORY LONG-TERM WASTE STORAGE PROGRAM. PROGRESS REPORT NO. 4, JANUARY--FEBRUARY 1974.
Mar 74, 20p

Descriptors: (*Savannah river plant, *Waste storage), (*Radioactive waste processing, *Solidification), (*Concretes, Waste storage), Leaching, Liquid wastes, Radioactive wastes, Research programs, Slurries, Solid wastes.

For abstract, see NSA 29 12, number 29178.

GEMP-635 PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Missile and Space Div.
FISSION PRODUCT BEHAVIOR WITHIN TWO W--UO SUB 2 CERMET FUEL ELEMENTS IRRADIATED IN A TEMPERATURE GRADIENT.
D. A. Seifert, R. L. Stuart, P. K. Conn, H. W. McLaughlin, and G. J. Luersen. Aug 68, 37p
Contract AT(40-1)-2847

Descriptors: (*Cermets, *Inclusions), (*Uranium dioxide, Inclusions), (*Tungsten alloys, Inclusions), (*Thorium oxides, Inclusions), Cesium 137, Diffusion, Fission product release, Fission products, Gases, Irradiation, Krypton 85, Nuclear fuels, Retention, Spatial distribution, Temperature dependence, Temperature gradients.

For abstract, see NSA 29 12, number 29986.

IDO-22053 PC$7.60/MF$1.45
Geological Survey, Idaho Falls, Idaho (Usa). Water Resources Div.
INFLUENCE OF LIQUID WASTE DISPOSAL ON THE GEOCHEMISTRY OF WATER AT

THE NATIONAL REACTOR TESTING STATION, IDAHO: 1952--1970.
J. B. Robertson, R. Schoen, and J. T. Barraclough. Feb 74, 231p

Descriptors: (*Nrts, *Hydrology), (*Waste disposal, *Underground disposal), (*Surface waters, *Contamination), (*Ground water, Contamination), Cesium 137, Cobalt 60, Fuel reprocessing plants, Geochemistry, Geologic deposits, Geophysics, Liquid wastes, Meteorology, Radiation monitoring, Radioactive waste disposal, Radioactive wastes, Radionuclide migration, Strontium 90, Test reactors, Thermal effluents, Tritium, Water pollution.

For abstract, see NSA 29 12, number 30186.

RD/B/N-2786 PC$4.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
TRANSPORT OF ADSORBING, RADIOACTIVE SPECIES IN A MEDIUM WITH POROUS STRUCTURE DEFINED BY A DISTRIBUTION FUNCTION.
R. S. Rodliffe. Nov 73, 19p RPC/M3FPR/P-(74)2

Descriptors: Adsorption, Distribution functions, Fission products, Flow models, Gaseous diffusion, Gases, Knudsen flow, Laminar flow, Porosity, Surfaces.

For abstract, see NSA 29 12, number 31657.

WASH-1297 PC$5.45/MF$1.45
Usaec Division of Waste Management and Transportation, Washington, D.C.
HIGH-LEVEL RADIOACTIVE WASTE MANAGEMENT ALTERNATIVES.
May 74, 94p

Descriptors: (*Waste management, *Reviews), Marine disposal, Polar regions, Space, Transmutation, Underground disposal, Us aec.

For abstract, see NSA 29 12, number 30190.

18H. Radioactivity

AD-780 428/9GA PC$3.75/MF$1.45
Naval Ordnance Lab White Oak Md
COMPUTATION OF THE RESIDUAL RADIATION TRANSMISSION FACTOR FOR THE MARINE CORPS LVTP7.
Final rept.,
Robert G. Cawley. 28 Sep 73, 52p Rept no. NOLTR-73-137

Descriptors: *Amphibious vehicles, *Fallout, *Radiation protection, Gamma rays, Attenuation, Computations.
Identifiers: LVTP-7 vehicles, M-113 vehicles.

The present work reports the results of an effort to compute the protection factor and the residual radiation transmission factor for the Marine Corps LVTP7 troop carrier in a field of radioactive fallout. The P7 is similar to another vehicle, the army M113 APC (armored personnel carrier), for which experimental data are available, and the author has used those results in the method. Briefly, the author has developed an approximate analytical technique, which enables us to calculate the protection factor for an enclosure whose walls are composed of plane slabs having arbitrary orientations.

AECL-4585 PC$7.25/MF$1.45
Atomic Energy of Canada LTD., Pinawa, Manitoba. Whiteshell Nuclear Research Establishment.
CONVERSION TO SI UNITS OF SOME PORTIONS OF THE ASME PRESSURE VESSEL AND BOILER CODE, SECTION III (1971 EDITION).
D. A. Head, and D. Christie. Dec 73, 83p

Descriptors: (*Pressure vessels, *Stress analysis), (*Boilers, Stress analysis), Data, Manuals, Specifications, Standards, Tables.

For abstract, see NSA 29 12, number 29220.

BNL-18625 PC$6.75/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
1973 ENVIRONMENTAL MONITORING REPORT.
A. P. Hull, and J. A. Ash. Mar 74, 73p

Descriptors: (*Bnl, *Radiation monitoring), (*Surface air, Radiation monitoring), (*Atmospheric precipitations, Radiation monitoring), (*Liquid wastes, Radiation monitoring), Abundance, Alpha sources, Aquatic ecosystems, Beta sources, Cesium 137, Environment, Gamma sources, Gramineae, Grass, Ground water, Iodine 131, Milk, Potassium, Soils, Strontium 90, Surface waters, Tritium.

For abstract, see NSA 29 12, number 29390.

NP-19971 PC$4.00/MF$1.45
National Radiological Protection Board, Harwell (Uk).
CODE OF PRACTICE FOR THE DISPLAY OF SOURCES OF IONIZING RADIATIONS AT EXHIBITIONS.
Dec 73, 11p

Descriptors: (*Radiation protection, *Recommendations), (*Radiation sources, *Safety standards), Human populations, Ionizing radiations, United kingdom.

For abstract, see NSA 29 12, number 31574.

UCRL-50007-73-3 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HAZARDS CONTROL PROGRESS REPORT NO. 47, SEPTEMBER--DECEMBER 1973.
15 Feb 74, 30p
Contract W-7405-eng-48

Descriptors: (*Hazards, *Research programs), Air filters, Air samplers, Fissile materials, Neutron spectrometers, Polarization, Respirators, Safeguards, Safety engineering, X radiation, X-ray fluorescence analysis.

For abstract, see NSA 29 12, number 29280.

18I. Reactor Engineering and Operation

ANCR-1146 PC$5.45/MF$1.45
Aerojet Nuclear CO., Idaho Falls, Idaho (Usa).
EXPERIMENT DATA REPORT FOR 1-1/2-LOOP SEMISCALE SYSTEM ISOTHERMAL TEST 1011.
R. S. Alder, E. M. Feldman, and P. A. Pinson. Mar 74, 50p
Contract AT(10-1)-1375

Descriptors: (*Pwr type reactors, Blowdown), (*Blowdown, *Testing), Fluid flow, Heat transfer, Mockup, Pressure gradients, Simulation, Temperature dependence.

For abstract, see NSA 29 12, number 31350.

BNWL-1787 PC$7.60/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
TECHNIQUE FOR ENVIRONMENTAL DECISION MAKING USING QUANTIFIED SOCIAL AND AESTHETIC VALUES.
J. B. Burnham, M. H. Karr, G. L. Wilfert, W. S. Maynard, and S. M. Nealey. Feb 74, 255p
Contract AT(45-1)-1830

Descriptors: (*Nuclear power plants, *Site selection), (*Reactor sites, *Planning), Economics, Ecosystems, Environment, Human populations, Safety, Sociology.

For abstract, see NSA 29 12, number 31352.

COO-2152-6 PC$4.00/MF$1.45
Cincinnati Univ., Ohio (Usa). Dept. Of Chemical and Nuclear Engineering.
INVESTIGATION OF PRESSURE DROPS AND HEAT TRANSFER COEFFICIENTS FOR LOSS OF COOLANT EVALUATIONS. QUARTERLY PROGRESS REPORT PERIOD ENDING DECEMBER 31, 1972.
1972, 6p
Contract AT(11-1)-2152

Descriptors: (*Loss of coolant, *Heat transfer), (*Water cooled reactors, Loss of coolant), Pressure gradients, Transition boiling, Two-phase flow.

For abstract, see NSA 29 12, number 31353.

FPR-2-74 PC$3.50/MF$1.45
Ukaea Weapons Group, Foulness. Atomic Weapons Research Establishment.
UO SUB 2 /SODIUM THERMAL INTERACTION EXPERIMENTS AT A.W.R.E. FOULNESS SINCE JANUARY 1972.
K. I. Darby, R. C. Pottinger, R. G. Turner, and N. J. M. Rees. Jan 74, 26p CONF-731126-3, TRG-Memo-6416

Descriptors: (*Lmfbr type reactors, *Fuel-coolant interactions), Explosions, Heat transfer, Reactor safety, Sodium, Temperature dependence, Uranium dioxide.

For abstract, see NSA 29 12, number 31356.

ORNL-NSIC-100 PC$15.00/MF$1.45
Oak Ridge National Lab., Tenn. (Usa).
NUCLEAR POWER AND RADIATION IN PERSPECTIVE. SELECTIONS FROM NUCLEAR SAFETY.
J. R. Buchanan. Mar 74, 182p
Contract W-7405-eng-26

Descriptors: (*Nuclear power plants, *Radiation hazards), Nuclear insurance, Radiation protection, Reactor licensing, Reactor safety.

For abstract, see NSA 29 12, number 31359.

PWAC-403 PC$6.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
FINAL REPORT ON LCRE CONTROL DRUM DRIVE DEVELOPMENT.
E. J. Zigmond. 13 Feb 64, 71p
Contract AT(30-1)-2789

Descriptors: (*Lcre reactor, *Control rod drives), Configuration, Performance testing, Specifications.

For abstract, see NSA 29 12, number 31419.

RD/B/N-2827 PC$4.75/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
FLOW CALIBRATION UNIT FOR USE IN HEAT TRANSFER RIGS.
M. J. Stephens. Oct 73, 32p

Descriptors: (*Coolant loops, *Calibration), (*Flowmeters, *Design), Accuracy, Gas flow, Heat transfer, Orifices.

For abstract, see NSA 29 12, number 29244.

TID-3339-P1-1 PC$7.60/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
GAS-COOLED REACTOR TECHNOLOGY. A BIBLIOGRAPHY (PART 1).
J. W. Rushing. Apr 74, 191p

Descriptors: (*Gas cooled reactors, *Bibliographies).

For abstract, see NSA 29 12, number 31135.

TID-3339-P1-2 PC$4.00/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
GAS-COOLED REACTOR TECHNOLOGY. A BIBLIOGRAPHY (PART 1-INDEX).
J. W. Rushing. Apr 74, 22p

Descriptors: (*Gas cooled reactors, *Bibliographies), Indexes.

For abstract, see NSA 29 12, number 31136.

TID-3339-P2-1 PC$10.60/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
GAS-COOLED REACTOR TECHNOLOGY. A BIBLIOGRAPHY (PART 2).
J. W. Norris. Apr 74, 372p

Descriptors: (*Gas cooled reactors, *Bibliographies).

For abstract, see NSA 29 12, number 31137.

TID-3339-P2-2 PC$5.45/MF$1.45
Usaec Technical Information Center, Oak Ridge, Tenn.
GAS-COOLED REACTOR TECHNOLOGY. A BIBLIOGRAPHY (PART 2-INDEX).
J. W. Norris. Apr 74, 106p

Descriptors: (*Gas cooled reactors, *Bibliographies), Indexes.

For abstract, see NSA 29 12, number 31138.

UCRL-51507 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SEISMIC ANALYSIS LIVERMORE POOL TYPE REACTOR FACILITY, LAWRENCE LIVERMORE LABORATORY.
R. C. Murray, and F. J. Tokarz. 15 Nov 73, 34p
Contract W-7405-eng-48

Descriptors: (*Lptr reactor, *Seismic effects), Containment buildings, Cranes, Earthquakes, Heat exchangers, Reactor components, Reactor safety, Shielding.

For abstract, see NSA 29 12, number 31360.

18J. Reactor Materials

AE-RL-1326 PC$5.25/MF$1.45
Aktiebolaget Atomenergi, Studsvik (Sweden).
SECONDARY FLOW VELOCITIES IN A ROD BUNDLE OF TRIANGULAR ARRAY.
C. Hall, and P. J. Svenningsson. 27 Oct 71, 42p

Descriptors: (*Fuel assemblies, *Flow rate), Configuration, Fluid flow, Fuel rods, Mixing, Testing, Velocity.

For abstract, see NSA 29 12, number 31404.

AECL-4443 PC$5.50/MF$1.45
Atomic Energy of Canada LTD., Pinawa, Manitoba. Whiteshell Nuclear Research Establishment.
URANIUM CARBIDE FUEL FOR ORGANIC COOLED REACTORS.
R. W. Jones, and J. L. Crosthwaite. Dec 73, 47p

Descriptors: (*Uranium carbides, *Performance), (*Organic cooled reactors, *Nuclear fuels), Burnup, Irradiation, Physical radiation effects, Power reactors, Swelling.

For abstract, see NSA 29 12, number 29977.

BAW-3647-27 PC$3.00/MF$1.45
Babcock and Wilcox CO., Lynchburg, VA. (Usa). Research and Development Div.
PHYSICS VERIFICATION PROGRAM PART III, TASK 9. QUARTERLY TECHNICAL REPORT, APRIL--JUNE 1973.
M. N. Baldwin, and H. W. Webb. Dec 73, 20p
Contract AT(11-1)-3109

Descriptors: (*Fuel rods, *Fission), (*Uranium dioxide, Fission), Absorption, Boron, Burnable poisons, Neutrons, Zero power reactors.

For abstract, see NSA 29 12, number 31406.

BLG-485 PC$3.00/MF$1.45
Centre d'Etude de l'Energie Nucleaire, Brussels (Belgium).
DISPERSION-STRENGTHENED FERRITIC STEELS AS FAST REACTOR STRUCTURAL MATERIALS.
J. J. Huet, and V. Leroy. Nov 73, 16p

Descriptors: (*Fast reactors, *Fuel cans), (*Liquid metal cooled reactors, Fuel cans), (*Steels, *Dispersion hardening), Chromium steels, Corrosion, Embrittlement, Fast neutrons, High temperature, Mechanical properties, Molybdenum alloys, Neutron beams, Physical radiation effects, Ruptures, Sodium, Tensile properties, Titanium alloys, Titanium oxides, Yttrium oxides.

For abstract, see NSA 29 12, number 30075.

CNLM-3896 PC$5.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
SUMMARY OF NUCLEAR FUELS AND MATERIALS DEVELOPMENT, CALENDAR YEAR 1961.
16 Nov 61, 46p
Contract AT(30-1)-2789

Descriptors: (*Reactor materials, *Research programs), (*Nuclear fuels, Research programs), Coatings, Lithium, Niobium alloys, Uranium carbides, Uranium nitrides.

For abstract, see NSA 29 12, number 29967.

CNLM-3901 PC$4.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
SUMMARY OF RECENT NUCLEAR FUELS RESEARCH AND DEVELOPMENT AT CANEL.
21 Nov 61, 31p
Contract AT(30-1)-2789

Descriptors: (*Uranium carbides, *Research programs), (*Uranium nitrides, Research programs), (*Niobium alloys, *Cermets), Fabrication, Nuclear fuels, Synthesis, Tungsten alloys, Zirconium carbides.

For abstract, see NSA 29 12, number 29979.

CNLM-4311 PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
SUMMARY OF RECENT URANIUM NITRIDE FUEL RESEARCH AND DEVELOPMENT.
9 Nov 62, 19p
Contract AT(30-1)-2789

Descriptors: (*Uranium nitrides, *Testing), (*Zirconium nitrides, Testing), (*Liquid metal cooled reactors, *Nuclear fuels), Compatibility, Fabrication, Fission product release, Hardness, Irradiation, Stability.

For abstract, see NSA 29 12, number 29980.

CONF-730985 PC$16.75/MF$1.45
Usaec Grand Junction Office, Colo.
AEC NUCLEAR INDUSTRY SEMINAR, GRAND JUNCTION, COLORADO, SEPTEMBER 6--7, 1973.
1973, 293p

Descriptors: (*Uranium, *Meetings), Economics, Leading abstract, Nuclear industry, Nuclear power plants, Planning.

For abstract, see NSA 29 12, number 29284.

EUR-5078 PC$5.50/MF$1.45
Commission of the European Communities, Karlsruhe (F.R. Germany). European Inst. For Transuranium Elements.
SELF-DIFFUSION OF URANIUM IN URANIUM MONOCARBIDE-EVALUATION OF CURVED ARRHENIUS DIAGRAMS.
H. Matzke, and H. A. Tasman. Feb 74, 50p

Descriptors: (*Uranium, *Self-diffusion), (*Uranium carbides, Self-diffusion), (*Diffusion, *Arrhenius equation), Kinetics, Temperature dependence.

For abstract, see NSA 29 12, number 29982.

GA-4022(Pt.2) PC$4.25/MF$1.45
General Dynamics Corp., San Diego, Calif. (Usa). General Atomic Div.
ADVANCED, GRAPHITE-MATRIX, DISPERSION-TYPE FUEL SYSTEMS. FIRST ANNUAL REPORT, APRIL 1, 1962--MARCH 31, 1963.
W. V. Goeddel, N. L. Sandefur, and J. L. White. 1 May 63, 42p
Contract AT(04-3)-167

Descriptors: (*Dispersion nuclear fuels, *Hot working), (*Coated fuel particles, *Diffusion), (*Uranium, Diffusion), Coatings, Compression, Graphite, Matrix materials, Pyrolytic carbon, Uranium carbides, Zirconium carbides.

For abstract, see NSA 29 12, number 29983.

GEMP-10-B PC$4.75/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
HIGH-TEMPERATURE MATERIALS PROGRAM PROGRESS REPORT NO. 10, PART B.
16 Apr 62, 54p
Contract AT(40-1)-2847

Descriptors: (*Dispersion nuclear fuels, *Research programs), (*Uranium dioxide, Dispersion nuclear fuels), (*Yttrium oxides, Dispersion nuclear fuels), (*Uranium oxides, Dispersion nuclear fuels), Beryllium oxides, Ceramics, Coated fuel particles, Coatings, Diffusion, Fission products, Zirconium oxides.

For abstract, see NSA 29 12, number 29984.

HW-31000(Del.) PC$47.50/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
PUREX TECHNICAL MANUAL.
25 Mar 55, 907p
Contract W-31-109-eng-52

Descriptors: (*Purex process, *Manuals), (*Spent fuels, *Reprocessing), Control, Plutonium, Radiation protection, Radioactive wastes, Safety, Uranium.

For abstract, see NSA 29 12, number 29196.

ICP-1039 PC$4.00/MF$1.45
Allied Chemical Corp., Idaho Falls, Idaho (Usa). Idaho Chemical Programs - Operations Office.
STABILITY OF COMPLEXED ROVER DISSOLVER SOLUTIONS CONTAINING HIGH CONCENTRATIONS OF NIOBIUM, FLUORIDE-ION, AND ALUMINUM.
J. A. Rindfleisch. Feb 74, 19p
Contract AT(10-1)-1375

Descriptors: (*Spent fuels, *Reprocessing), (*Uranium, *Separation processes), Aluminium nitrates, Combustion, Dissolution, Hydrofluoric acid, Niobium, Nitric acid, Rover reactors, Stability, Time dependence.

For abstract, see NSA 29 12, number 29197.

KFK-1910 PC$7.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Radiochemie.
SYSTEM URANIUM OXIDE--EUROPIUM OXIDE--OXYGEN.
R. Tanamas. Dec 73, 84p
In German.

Descriptors: (*Uranium dioxide, *Phase studies), (*Europium oxides, Phase studies), Phase diagrams, Phase transformations, Temperature dependence.

For abstract, see NSA 29 12, number 29987.

LA-4308 PC$4.75/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
DEVELOPMENT OF PARTICLES COATED WITH PYROLYTIC CARBON. VIII. IMPROVED CORE-COAT COMBINATIONS.
R. J. Bard, H. R. Baxman, J. P. Bertino, S. W. Hayter, and J. A. O'Rourke. Oct 69, 52p
Contract W-7405-eng-36

Descriptors: (*Rover reactors, Coated fuel particles), (*Coated fuel particles, *Stability), (*Uranium carbides, *Coatings), Layers, Leaching, Pyrolytic carbon, Very high temperature.

For abstract, see NSA 29 12, number 29988.

RT/PROT-(73)28 PC$5.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
ARIEL: CODE FOR THE STUDY OF TRANSIENT THERMAL BEHAVIOR OF A FUEL ELEMENT.
A. Morici, D. Principe, and G. Santarossa. 11 Oct 73, 58p
In Italian.

Descriptors: (*Fuel assemblies, *Heat transfer), (*Fuel rods, Heat transfer), (*Computer codes, *A codes), Configuration, Transients.

For abstract, see NSA 29 12, number 31409.

TID-26542 PC$5.50/MF$1.45
Argonne National Lab., Ill. (Usa).
PARTIAL FUEL STRATEGY EXAMPLE ON THE TRANSITION TO FAST BREEDER SELF-FUELING.
J. T. Weills. 15 May 67, 46p

Descriptors: (*Bwr type reactors, *Fuel cycle), (*Pwr type reactors, Fuel cycle), (*Fbr type reactors, Fuel cycle), (*Nuclear fuel conversion, *Planning), Cost, Economics, Nuclear fuels, Plutonium, Uranium.

For abstract, see NSA 29 12, number 31428.

WASH-1051 PC$4.75/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
RESPONSE TO QUESTIONS OF THE PRESIDENT'S SCIENCE ADVISORY COMMITTEE. PERTAINING TO THE AEC'S ADVANCED HIGH-TEMPERATURE GAS REACTOR: 710 PROGRAM.
24 Sep 64, 53p

Descriptors: (*Tantalum, *Uses), (*Tungsten, Uses), Comparative evaluations, Design, Nuclear fuels, Reactor materials, Research programs, Snap reactors, Space power reactors, Specifications.

For abstract, see NSA 29 12, number 30091.

WASH-1313 PC$4.00/MF$1.45
Atomic Energy Commission, Washington, D.C.
PROCEDURES FOR PICKING UP AND RECEIVING PACKAGES OF RADIOACTIVE MATERIAL,
Final rept.
Jun 74, 20p*

Descriptors: *Radioactive materials, *Materials handling, Delivery, Receiving, Radiation shielding, Monitors.

Amendments to AEC regulations in 10 CFR 20.205, dealing with delivery and pickup from a carrier of packages containing radioactive materials, are described. Purposes of the amended procedures are to minimize transit time for radioactive materials, to require prompt monitoring for excessive radiation, and to describe procedures for immediate notification of proper authorities when excessive radiation is found.

18K. Reactor Physics

BAW-3647-28 PC$4.00/MF$1.45
Babcock and Wilcox CO., Lynchburg, VA. (Usa). Research and Development Div.
PHYSICS VERIFICATION PROGRAM, PART III, TASK 9. QUARTERLY TECHNICAL REPORT, JULY--SEPTEMBER 1973.
H. W. Webb, and M. N. Baldwin. Feb 74, 16p
Contract AT(11-1)-3109

Descriptors: (*Zero power reactors, *Burnable poisons), (*Uranium dioxide, *Fission), Absorption, Boron, Reactor kinetics, Reactor lattice parameters, Regulating rods.

For abstract, see NSA 29 12, number 31375.

NP-19972 PC$4.00/MF$1.45
Valtion Teknillinen Tutkimuskeskus, Otaniemi (Finland). Reaktorilaboratorio.
INTERPRETATION OF NEUTRON AND GAMMA NOISE MEASUREMENTS BASED ON A STOCHASTIC TWO-GROUP MODEL.
B. Baers. Nov 72, 18p

Descriptors: (*Reactor noise, *Mathematical models), Fast neutrons, Gamma radiation, Stochastic processes, Thermal neutrons.

For abstract, see NSA 29 12, number 31386.

RT/FI-(73)40 PC$6.50/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Rome (Italy).
NUCLEAR NOISE: TWO GENERALIZED POISSON DISTRIBUTIONS.
N. Pacilio, and V. M. Jorio. 23 Oct 73, 66p
In Italian.

Descriptors: (*Reactor noise, *Spatial distribution), Poisson equation, Probability.

For abstract, see NSA 29 12, number 31387.

18N. Snap Technology

ACNP-62015-A PC$18.00/MF$1.45
Allis-Chalmers Mfg. Co., Milwaukee, Wis. (Usa). Atomic Energy Div.
MOBILE ENERGY DEPOT FEASIBILITY STUDY: SUMMARY REPORT.
S. B. Burwell, J. A. Carlson, R. G. Clark, L. E. Donelan, and A. F. Erwin. 13 Jul 62, 317p
Contract AT(30-1)-2931

Descriptors: (*Mobile reactors, *Specifications), (*Process heat reactors, Specifications), Electrolysis, Fuel cells, Hydrogen, Performance, Uses.

For abstract, see NSA 29 12, number 31278.

AD-780 215/0GA PC$4.00/MF$1.45
Naval Ordnance Lab White Oak Md
DESIGN GUIDE FOR RADIOISOTOPE POWER GENERATOR PRESSURE VESSELS.
Final rept. Dec 72-Jan 74,
Bernard M. Finn. 6 Feb 74, 89p Rept no. NOLTR-74-33

Descriptors: *Radioisotope thermoelectric devices, *Electric generators, *Pressure vessels, Radioactive isotopes, Deep water, Oceans, Electric connectors, Seals, Quality assurance, Nickel alloys, Copper alloys, Titanium alloys.
Identifiers: Design, Nickel alloy Hastelloy C-276.

The guide is the end product of an engineering investigation to establish criteria and inspection procedures to assure long term structural and watertight integrity for radioisotope power generator (RPG) pressure vessels. The suggested construction of the RPG consists of a cylindrical pressure housing with either two formed torospherical end closures circumferentially edge welded to the housing or a flanged housing to which a formed end closure is bolted. The materials of construction are comprised of alloys of nickel, copper and titanium with the Hastelloy alloy C-276 being the preferred choice. The design of the electrical penetrator follows that suggested in the 'Handbook of Vehicle Penetrators, Connectors and Harnesses for Deep Ocean Applications.' The testing requirements consist of design verification tests for the electrical penetrators and sequential hydrostatic and leak testing of the RPG pressure vessel. The hydrostatic tests should be performed at 1.5 times design operating pressure. (Author)

CNLM-4257 PC$4.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
REACTOR CONCEPTUAL DESIGN STUDIES APPLICABLE TO SNAP-50.
J. L. Levengood, and D. Fultonberg. 30 Nov 62, 32p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Pressure vessels), Configuration, Efficiency, Fuel pins, Performance, Reactor control systems, Reactor cores, Specifications, Supports.

For abstract, see NSA 29 12, number 31279.

CNLM-4385 PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
SNAP-50 REACTOR DEVELOPMENT CONCEPT.
15 Jan 63, 17p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Performance), Specifications.

For abstract, see NSA 29 12, number 31280.

CNLM-4419(Vol.1) PC$4.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
SUMMARY OF THE SNAP-50 PROGRAM AT CANEL.
1 Feb 63, 28p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Reactor materials), Cost, Performance, Research programs, Specifications.

For abstract, see NSA 29 12, number 31281.

CNLM-4419(Vol.2) PC$5.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
SUMMARY OF THE SNAP-50 PROGRAM AT CANEL.
1 Feb 63, 70p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Reactor components), (*Lcre reactor, Reactor components), Fabrication, Reactor materials, Specifications, Testing.

For abstract, see NSA 29 12, number 31282.

CNLM-4423 PC$5.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
TECHNICAL BRIEF (OF) SNAP-50 AND LCRE PROGRAMS.
1 Mar 63, 41p
Contract AT(30-1)-2789

Descriptors: (*Lcre reactor, *Cost), (*S50 reactor, *Research programs), Performance, Specifications, Testing.

For abstract, see NSA 29 12, number 31283.

CNLM-5021 PC$6.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
SUMMARY OF LCRE FUEL ELEMENT DESIGN INCLUDING SUPPORTING EXPERIMENTAL DATA.
12 Jun 63, 70p
Contract AT(30-1)-2789

Descriptors: (*Lcre reactor, *Fuel pins), Beryllium oxides, Fission products, Performance, Specifications, Uranium dioxide.

For abstract, see NSA 29 12, number 31284.

CNLM-5118 PC$6.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
SNAP-50/SPUR FIRST FLIGHT POWERPLANT: PRELIMINARY DESIGN SPECIFICATIONS.
21 Jun 63, 67p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Specifications), Configuration, Reactor components, Reactor kinetics, Reactor materials.

For abstract, see NSA 29 12, number 31285.

CNLM-5261 PC$9.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
MATERIALS TASKS FOR LCRE, SNAP-50/SPUR, AND ADVANCED MATERIALS PROGRAMS.
27 Sep 63, 136p
Contract AT(30-1)-2789

Descriptors: (*Snap reactors, *Reactor materials), Diagrams, Liquid metal cooled reactors, Meetings.

For abstract, see NSA 29 12, number 29968.

CNLM-5340 PC$7.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
SNAP-50/SPUR REFERENCE DESIGN NO. 1.
J. S. Murphy. 9 Dec 63, 79p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Specifications), Configuration, Electrical equipment, Pipelines, Reactor control systems, Reactor instrumentation, Space vehicles.

For abstract, see NSA 29 12, number 31286.

CNLM-5472 PC$4.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
PRELIMINARY STUDY OF A 1 MWE UNDERWATER POWERPLANT.
R. d'Arcy, and G. Sinko. 22 Jan 64, 35p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Specifications), Performance, Thermodynamic cycles, Underwater, Uses.

For abstract, see NSA 29 12, number 31287.

CNLM-5889 PC$18.50/MF$1.45
Garrett Corp., Los Angeles, Calif. (Usa). Airesearch Mfg. Div.
SNAP-50/SPUR PROGRAM SUMMARY.
1964, 306p

Descriptors: (*S50 reactor, *Research programs), Reviews.

For abstract, see NSA 29 12, number 31288.

CNLM-5889(Rev.2) PC$11.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
SNAP-50/SPUR PROGRAM SUMMARY.
Oct 64, 158p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Pumps), Configuration, Reactor components, Reactor control systems, Reactor instrumentation, Reactor kinetics, Reactor materials, Research programs, Shielding, Specifications.

For abstract, see NSA 29 12, number 31289.

CNLM-6086 PC$5.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
SNAP-50/SPUR PROGRAM ANNUAL TECHNICAL REPORT, 1964.
15 Mar 64, 41p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Research programs), Pumps, Reactor components, Reactor control systems, Reactor instrumentation, Reactor kinetics, Reactor materials, Shielding, Specifications, Steam generators, Testing.

For abstract, see NSA 29 12, number 31290.

COO-2155-3 PC$3.50/MF$1.45
Utah Univ., Salt Lake City (Usa). Dept. Of Surgery.
BIOMEDICAL ENGINEERING SUPPORT. QUARTERLY PROGRESS REPORT.
W. J. Kolff. 15 Mar 72, 29p
Contract AT(11-1)-2155

Descriptors: (*Mechanical heart, *Research programs), Radioisotope heat sources.

For abstract, see NSA 29 12, number 29629.

COO-2155-5 PC$4.75/MF$1.45
Utah Univ., Salt Lake City (Usa). Dept. Of Surgery.
BIOMEDICAL ENGINEERING SUPPORT. ANNUAL REPORT.
W. J. Kolff. 15 Jul 72, 51p
Contract AT(11-1)-2155

Descriptors: (*Mechanical heart, *Research programs), Radioisotope heat sources.

For abstract, see NSA 29 12, number 29630.

COO-2155-6 PC$3.25/MF$1.45
Utah Univ., Salt Lake City (Usa). Dept. Of Surgery.
BIOMEDICAL ENGINEERING SUPPORT. QUARTERLY PROGRESS REPORT.
W. J. Kolff, D. K. Backman, and G. M. Sandquist. 15 Oct 72, 23p
Contract AT(11-1)-2155

Descriptors: (*Mechanical heart, *Research programs), Radioisotope heat sources.

For abstract, see NSA 29 12, number 29631.

COO-2155-7 PC$3.50/MF$1.45
Utah Univ., Salt Lake City (Usa). Inst. For Biomedical Engineering.
BIOMEDICAL ENGINEERING SUPPORT. QUARTERLY PROGRESS REPORT, OCTOBER 15, 1972--FEBRUARY 15, 1973.
W. J. Kolff. 15 Feb 73, 29p
Contract AT(11-1)-2155

Descriptors: (*Mechanical heart, *Research programs), Performance testing, Radioisotope heat sources.

For abstract, see NSA 29 12, number 29632.

DC-60-5-11 PC$3.00/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Aircraft Nuclear Propulsion Dept.
INVESTIGATION OF THERMAL SHIELD POISONING EFFECTS ON THE P140B SHIELD.
R. E. Wysnewski, and E. P. Jacobs. 5 May 60, 18p
Contract AT(11-1)-171

Descriptors: (*Aircraft propulsion reactors, Shielding), (*Shielding, *Gamma radiation), Boron, Gadolinium, Heating, Neutron flux.

For abstract, see NSA 29 12, number 31291.

DC-60-6-1 PC$22.25/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Aircraft Nuclear Propulsion Dept.
PROJECT 101 QUARTERLY TASK REPORT, APRIL--JUNE 1960.
Jun 60, 405p
Contract AT(11-1)-171

Descriptors: (*Aircraft propulsion reactors, *Research programs), Configuration, Fuel elements, Heat transfer, Reactor components, Reactor cores, Reactor kinetics, Specifications.

For abstract, see NSA 29 12, number 31292.

FXM-4917 PC$4.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
HIGH POWER, EXTREME ENDURANCE MOBILE REACTOR CONCEPT WITH AIRCRAFT NUCLEAR PROPULSION POTENTIAL.
C. W. Jr. Johnson. 19 Dec 60, 15p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Specifications), (*Mobile reactors, Specifications), (*Lithium cooled reactors, Specifications), Criticality, Reactor control systems, Reactor cores, Reactor kinetics, Shielding.

For abstract, see NSA 29 12, number 31293.

GEMP-442 PC$12.00/MF$1.45
General Electric CO., Idaho Falls, Idaho (Usa).
710 MOCKUP NO. 1 CRITICAL EXPERIMENT. SUMMARY DATA REPORT.
F. L. Sims, J. F. Kunze, G. D. Pincock, and P. L. Chase. 21 Oct 66, 200p
Contract AT(40-1)-2847

Descriptors: (*710 reactor, *Mockup), Configuration, Neutron flux, Power density, Reactivity worths, Reactor cores, Zero power reactors.

For abstract, see NSA 29 12, number 31294.

GEMP-461 PC$6.75/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
STUDIES OF RADIAL REFLECTOR WORTH DEPENDENCE ON RADIAL COMPONENT PROPERTIES AND ARRANGEMENT IN A FAST-SPECTRUM REACTOR.
J. W. Zwick. 16 Dec 66, 75p
Contract AT(40-1)-2847

Descriptors: (*710 reactor, *Neutron reflectors), Configuration, Reactivity worths, Reactor cores, Reactor materials.

For abstract, see NSA 29 12, number 31295.

GEMP-538 PC$3.25/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
NONDESTRUCTIVE TESTING AS APPLIED IN A REFRACTORY METAL CLAD FUEL ELEMENT DEVELOPMENT PROGRAM.
J. P. Clark, and D. E. Burgbacher. 4 Aug 67, 23p
Contract AT(40-1)-2847

Descriptors: (*710 reactor, *Fuel elements), Fuel assemblies, Fuel cans, Inspection, Nondestructive testing, Snap reactors, Space power reactors, Ultrasonic testing.

For abstract, see NSA 29 12, number 31296.

GEMP-554 PC$4.00/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
710 REACTOR THERMOELECTRIC SPACE POWER SYSTEM CONCEPTS.
D. P. Flitner. Sep 67, 39p
Contract AT(40-1)-2847

Descriptors: (*710 reactor, *Performance), Efficiency, Radiators, Reactor materials, Shielding, Thermodynamic cycles, Thermoelectric conversion.

For abstract, see NSA 29 12, number 31297.

GEMP-561 PC$4.75/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
710 REACTOR THERMOELECTRIC SPACE POWER SYSTEM CONCEPTS.
D. P. Flitner. 31 Oct 67, 2p
Contract AT(40-1)-2847

Descriptors: (*710 reactor, *Specifications), Configuration, Reactor components, Reactor materials, Thermodynamic cycles.

For abstract, see NSA 29 12, number 31298.

GEMP-600(Vol.2) PC$13.25/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Nuclear Materials and Propulsion Operation.
710 HIGH-TEMPERATURE GAS REACTOR PROGRAM SUMMARY REPORT. VOLUME II. REACTOR, SYSTEMS, AND FACILITIES DESIGN.
1967, 204p
Contract AT(40-1)-2847

Descriptors: (*710 reactor, *Reactor components), Fuel elements, Reactor kinetics, Shielding, Specifications, Testing, Thermodynamic cycles, Uses.

For abstract, see NSA 29 12, number 31299.

HW-84556 PC$4.00/MF$1.45
General Electric CO., Richland, Wash. (Usa). Hanford Atomic Products Operation.
ROVER GRAPHITE STUDIES. QUARTERLY PROGRESS REPORT, JULY--SEPTEMBER 1964.
15 Oct 64, 10p
Contract AT(45-1)-1350

Descriptors: (*Rover reactors, Graphite), (*Graphite, *Research programs), (*Niobium, *Chemical reactions), Bonding, Diffusion, Dispersion nuclear fuels, Orientation.

For abstract, see NSA 29 12, number 30165.

KFK-1933 PC$4.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Material- und Festkoerperforschung.
MATERIALS FOR IMPLANTABLE HEAT SOURCES FOR CIRCULATORY ASSIST-DEVICES.
S. Nazare. Feb 74, 29p
In German.

Descriptors: (*Mechanical heart, Radioisotope heat sources), (*Radioisotope heat sources, *Reviews), (*Plutonium 238, Radioisotope heat sources), Production, Safety.

For abstract, see NSA 29 12, number 29633.

LA-2748 PC$7.75/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
RADIOCHEMICAL MEASUREMENTS ON KIWI-B1A. SUMMARY REPORT.
J. E. Sattizahn, J. D. Knight, and G. A. Cowan.
Aug 62, 112p
Contract W-7405-eng-36

Descriptors: (*Kiwi-b1a reactor, *Fission products), Power density, Radiochemistry, Reactor operation, Spatial distribution.

For abstract, see NSA 29 12, number 31300.

LAMS-2484 PC$9.25/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
PRELIMINARY DESIGN STUDY OF KIWI-B TYPE INLET REFLECTOR-CORE SUPPORT STRUCTURES.
J. C. Rowley. May 60, 142p
Contract W-7405-eng-36

Descriptors: (*Kiwi-b reactor, *Supports), Configuration, Design, Reactor cores, Stress analysis.

For abstract, see NSA 29 12, number 31301.

MLM-1600 PC$9.00/MF$1.45
Mound Lab., Miamisburg, Ohio (Usa).
SUMMARY REPORT ON SNAP-19B (IRHS) PROGRAM.
D. E. Loyer, and C. H. Davenport. 27 Jun 69, 117p
Contract AT-33-1-Gen-53

Descriptors: (*Snap 19 battery, Radioisotope heat sources), (*Radioisotope heat sources, *Design), (*Plutonium 238, Radioisotope heat sources), Fabrication, Plutonium oxides.

For abstract, see NSA 29 12, number 29634.

MLM-2104 PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio (Usa).
THERMAL SHOCK ANALYSIS OF CERAMIC MULTIHUNDRED WATT SPHERES.
V. J. Tennery. 25 Mar 74, 33p
Contract AT-33-1-GEN-53

Descriptors: (*Plutonium 238, Radioisotope heat sources), (*Plutonium oxides, *Thermal shock), (*Radioisotope batteries, Radioisotope heat sources), (*Radioisotope heat sources, Thermal shock), Fracture properties, High temperature, Very high temperature.

For abstract, see NSA 29 12, number 29635.

MLM-2122 PC$4.00/MF$1.45
Mound Lab., Miamisburg, Ohio (Usa).
MOUND LABORATORY ISOTOPIC POWER FUELS PROGRAMS: OCTOBER--DECEMBER 1973.
15 Mar 74, 30p
Contract AT-33-1-GEN-53

Descriptors: (*Plutonium 238, Radioisotope heat sources), (*Radioisotope batteries, Radioisotope heat sources), (*Radioisotope heat sources, *Research programs), Plutonium oxides.

For abstract, see NSA 29 12, number 29636.

MND-3062-26 PC$5.00/MF$1.45
Martin Marietta Corp., Baltimore, MD. (Usa).
HYPERVELOCITY PARTICLE BREAKUP: ANALYSIS AND EXPERIMENT. FEASIBILITY REPORT.
W. E. Osmeyer, T. M. Olsen, and W. Braun. Jun 66, 39p
Contract AT(30-1)-3062

Descriptors: (*Thermoelectric generators, *Safety), (*Radioisotope heat sources, *Reentry), (*Plutonium 238, Radioisotope heat sources), Ablation, Analytical solution, Droplets, Liquid metals, Velocity.

For abstract, see NSA 29 12, number 29637.

MND-3062-29 PC$5.25/MF$1.45
Martin Marietta Corp., Baltimore, MD. (Usa).
SOLUBILITY STUDY OF STRONTIUM FUEL COMPOUNDS.
J. H. Gray. Jun 66, 43p
Contract AT(30-1)-3062

Descriptors: (*Thermoelectric generators, Radioisotope heat sources), (*Strontium 90, Radioisotope heat sources), (*Radioisotope heat sources, *Safety), (*Strontium compounds, *Solubility), Hydrochloric acid, Seawater, Strontium fluorides, Titanates, Water.

For abstract, see NSA 29 12, number 29638.

NASA-CR-54721 PC$9.00/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).
REACTOR AND MATERIALS TECHNOLOGY DEPARTMENT QUARTERLY REPORT ON TUNGSTEN--URANIUM DIOXIDE CERMET RESEARCH AND DEVELOPMENT ACTIVITIES, APRIL--JUNE 1965.
D. R. deHalas. Jul 65, 120p
Contract AT(45-1)-1830

Descriptors: (*Twmr reactor, *Fuel elements), (*Uranium dioxide, *Cermets), (*Tungsten alloys, Cermets), Fuel plates, Nondestructive testing, Nuclear fuels, Space propulsion reactors, Stress analysis, Supports, Water moderated reactors.

For abstract, see NSA 29 12, number 31302.

NASA-CR-72031 PC$15.25/MF$1.45
Battelle Pacific Northwest Labs., Richland, Wash. (Usa).

TUNGSTEN WATER MODERATED REACTOR FUEL SUPPORT DESIGN ANALYSIS.
D. T. Aase, T. J. Kempf, D. P. O'Keefe, W. C. Townsend, and D. S. Trent. Aug 66, 243p
Contract AT(45-1)-1830

Descriptors: (*Twmr reactor, *Fuel elements), Design, Performance, Spacers, Stress analysis, Supports.

For abstract, see NSA 29 12, number 31303.

PTB-ND-6 PC$5.00/MF$1.45
Physikalisch-Technische Bundesanstalt, Braunschweig (F.R. Germany). Neutronendosimetrie.
EXP 238 PU-SOURCE OF A THERMONUCLIDE BATTERY FOR A HEART PACEMAKER.
G. Dietze, H. Kluge, M. Matzke, H. Ramthun, and V. Siegel. Feb 74, 36p
In German.

Descriptors: (*Plutonium 238, Cardiac pacemakers), (*Thermoelectric generators, *Radioisotope heat sources), (*Cardiac pacemakers, *Safety), Dose rates, Gamma spectra, Neutrons, Plutonium oxides, Radiation doses.

For abstract, see NSA 29 12, number 29639.

PWAC-180 PC$3.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
ALL-NUCLEAR SUPERSONIC BOMBER POWERPLANT CHARACTERISTICS SUMMARY.
W. Gray, J. Brueger, J. Larson, and N. Andrews. 3 Jun 57, 35p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Performance), (*Lithium cooled reactors, Performance), Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31304.

PWAC-187 PC$6.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
MINIMUM ALTITUDE NUCLEAR BOMBER POWERPLANT CHARACTERISTICS SUMMARY.
V. Bronke, and W. Gray. 8 Jul 57, 57p

Descriptors: (*Aircraft propulsion reactors, *Performance), (*Sodium cooled reactors, Performance), Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31305.

PWAC-188 PC$7.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
WEAPONS SYSTEM 125A NUCLEAR BOMBER POWERPLANT CHARACTERISTIC SUMMARY.
J. Brueger, and W. Gray. 1 Jul 57, 91p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Performance), (*Sodium cooled reactors, Performance), Specifications.

For abstract, see NSA 29 12, number 31306.

PWAC-198 PC$10.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
SHIELD OPTIMIZATION CODE.
E. S. Rost, J. D. Pomeroy, and H. C. Woodsum. 1957, 151p

Descriptors: (*Aircraft propulsion reactors, Shielding), (*Shielding, *Optimization), Computer codes, Design, Gamma radiation, Lagrangian function, Neutrons, Radiation doses.

For abstract, see NSA 29 12, number 31307.

PWAC-201 PC$6.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NJ-11A POWERPLANT CHARACTERISTICS SUMMARY.
V. Bronke, J. Brueger, W. Gray, and R. Smith. 16 Sep 57, 59p

Descriptors: (*Aircraft propulsion reactors, *Performance), Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31308.

PWAC-217 PC$4.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
CHARACTERISTICS SUMMARY OF NUCLEAR TURBOPROP POWERPLANTS.
J. Brueger, and V. Bronke. 2 Jan 58, 25p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Performance), Lithium cooled reactors, Sodium cooled reactors, Specifications.

For abstract, see NSA 29 12, number 31309.

PWAC-242 PC$6.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NJ-12B SUPERSONIC BOMBER POWERPLANT PERFORMANCE CHARACTERISTICS SUMMARY.
W. Gray. 1 Apr 58, 62p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Performance), (*Sodium cooled reactors, Performance), Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31310.

PWAC-276 PC$5.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
APPLICATIONS OF ADVANCED LIQUID METAL-COOLED REACTORS, APRIL 15, 1959.
W. Gaffin. 22 Apr 59, 37p
Contract AT(11-1)-229

Descriptors: (*Lithium cooled reactors, *Specifications), (*Aircraft propulsion reactors, Specifications), (*Space propulsion reactors, Specifications), (*Mobile reactors, Specifications), Configuration, Performance.

For abstract, see NSA 29 12, number 31311.

PWAC-316 PC$9.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
PRELIMINARY INVESTIGATION OF ACCIDENT MECHANISMS OF THE INDIRECT CYCLE AIRCRAFT NUCLEAR PROPULSION SYSTEM.
P. I. Perry, and J. W. Walton. 15 Dec 60, 119p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Reactor accidents), Configuration, Failures, Reactor cores, Reactor safety.

For abstract, see NSA 29 12, number 31312.

PWAC-406 PC$6.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
STUDY OF ADAPTING THE SNAP-50 SPACE POWERPLANT TO A LUNAR BASE.
26 Jul 63, 60p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Design), Moon, Performance, Reactor components.

For abstract, see NSA 29 12, number 31313.

PWAC-408 PC$7.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
LITHIUM-COOLED REACTOR EXPERIMENT REACTOR OPERATIONS FINAL REPORT.
30 Jan 64, 112p
Contract AT(30-1)-2789

Descriptors: (*Lcre reactor, *Construction), Education, Personnel, Reactor operation, Specifications, Testing.

For abstract, see NSA 29 12, number 31314.

PWAC-419 PC$8.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
SAFETY SYSTEM LITHIUM-COOLED REACTOR EXPERIMENT.
24 Dec 63, 7p
Contract AT(30-1)-2789

Descriptors: (*Lcre reactor, *Reactor protection systems), Electrical equipment, Electronic circuits, Safety engineering, Specifications.

For abstract, see NSA 29 12, number 31315.

PWAC-431 PC$5.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
STATUS OF THE SNAP-50 REACTOR FUELS PARAMETRIC STUDIES. PART I.
H. B. Banach, and H. J. Richings. 4 Mar 64, 49p
Contract AT(30-1)-2789

Descriptors: (*Snap reactors, *Design), (*Uranium carbides, *Nuclear fuels), (*Uranium nitrides, Nuclear fuels), Fuel cans, Optimization, Physical radiation effects, Uranium dioxide, Weight.

For abstract, see NSA 29 12, number 29989.

PWAC-442 PC$5.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
STATUS OF THE SNAP-50/SPUR REACTOR FUELS PARAMETRIC STUDIES. PART II. 2-MW, 8-MW, 10,000-HOUR, AND 20,000-HOUR REACTOR DESIGNS.
H. J. Banach, and H. J. Richings. 14 Sep 64, 39p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Fuel elements), Performance, Performance testing, Reactor cores, Reactor kinetics, Specifications, Uranium carbides, Uranium nitrides.

For abstract, see NSA 29 12, number 31316.

PWAC-445 PC$5.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.

PRELIMINARY DESIGN OF THE 2 MWT REACTOR AND SHIELD (PWAR-20) FOR THE SNAP-50/SPUR POWERPLANT.
H. J. Banach. 30 Dec 64, 51p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Reactor cores), Fuel elements, Reactor kinetics, Shielding, Specifications.

For abstract, see NSA 29 12, number 31317.

PWAC-451 PC$8.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
PARAMETRIC STUDIES OF RADIATIVELY COOLED REACTORS FOR SPACE APPLICATIONS, 2 TO 40 MWT.
G. U. Parks, H. J. Banach, and M. H. Zeisser. Sep 65, 98p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Reactor kinetics), Fuel elements, Reactor control systems, Reactor cores, Specifications.

For abstract, see NSA 29 12, number 31318.

PWAC-457 PC$6.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
35 AND 300 KW(E) SNAP-50/SPUR POWERPLANTS FOR THE MANNED ORBITING SPACE STATION APPLICATION.
26 Mar 65, 82p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Specifications), Performance, Satellites, Space vehicles.

For abstract, see NSA 29 12, number 31319.

PWAC-471 PC$11.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
REACTOR AND SHIELD DESIGN STATUS--SNAP-50.
Sep 65, 156p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Reactor kinetics), Reactor components, Shielding, Specifications.

For abstract, see NSA 29 12, number 31320.

PWAC-487 PC$9.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
SNAP-50 CRITICAL EXPERIMENTS AND ANALYSIS.
R. C. Callen, P. S. Check, R. E. Kearney, and W. F. Welsh. Sep 65, 126p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Reactor cores), (*Zero power reactors, *Criticality), Configuration, Reactivity coefficients, Reactor kinetics.

For abstract, see NSA 29 12, number 31321.

PWAC-488 PC$8.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
URANIUM NITRIDE FUEL DEVELOPMENT, SNAP-50.
M. A. DeCrescente, M. S. Freed, and S. D. Caplow. Oct 65, 116p
Contract AT(30-1)-2789

Descriptors: (*Snap reactors, *Nuclear fuels), (*Niobium base alloys, *Fuel cans), (*Zirconium alloys, Fuel cans), Compatibility, Fabrication, Irradiation, Lithium, Mechanical properties, Physical properties, Physical radiation effects, Uranium nitrides.

For abstract, see NSA 29 12, number 29990.

PWAC-496 PC$5.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
PRELIMINARY DESIGN STUDY OF A 10 MWE NUCLEAR SPACE POWERPLANT FOR ELECTRIC PROPULSION.
Aug 65, 46p
Contract AT(30-1)-2789

Descriptors: (*Space power reactors, *Specifications), (*Lithium cooled reactors, Specifications), (*Space propulsion reactors, Specifications), Configuration, Reactor cooling systems, Reactor cores, Shielding, Space vehicles.

For abstract, see NSA 29 12, number 31322.

PWAC-554 PC$7.50/MF$1.45
Pratt and Whitney Aircraft, East Hartford, Conn. (Usa).
NUCLEAR PROPULSION PROGRAM ENGINEERING PROGRESS REPORT NO. 18, OCTOBER 1, 1955--DECEMBER 31, 1955.
1955, 108p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Research programs), (*Liquid metal cooled reactors, Research programs), Heat exchangers, Performance, Pipelines, Pumps, Reactor control systems, Reactor kinetics, Reactor materials, Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31323.

PWAC-573 PC$8.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NUCLEAR PROPULSION PROGRAM ENGINEERING PROGRESS REPORT NO. 25, JULY 1, 1957--OCTOBER 15, 1957.
1957, 121p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Research reactors), (*Sodium cooled reactors, Research reactors), (*Lithium cooled reactors, Research reactors), Electronic equipment, Performance, Pipes, Radiators, Reactor components, Reactor control systems, Reactor instrumentation, Reactor kinetics, Reactor materials, Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31324.

PWAC-574 PC$10.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NUCLEAR PROPULSION PROGRAM ENGINEERING PROGRESS REPORT, OCTOBER 1, 1957--DECEMBER 31, 1957.
1957, 156p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Research programs), (*Lithium cooled reactors, Research programs), (*Sodium cooled reactors, Research programs), Corrosion, Electronic equipment, Fuel elements, Lithium, Radiators, Reactor control systems, Reactor instrumentation, Reactor kinetics, Reactor materials, Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31325.

PWAC-581 PC$9.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NUCLEAR PROPULSION PROGRAM ENGINEERING PROGRESS REPORT, JANUARY 1, 1958--MARCH 31, 1958.
28 Apr 58, 154p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Research programs), (*Lithium cooled reactors, Research programs), Corrosion, Electronic equipment, Fuel elements, Lithium, Radiators, Reactor control systems, Reactor instrumentation, Reactor materials, Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31326.

PWAC-582 PC$9.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NUCLEAR PROPULSION PROGRAM ENGINEERING PROGRESS REPORT, APRIL 1, 1958--JUNE 30, 1958.
30 Jul 58, 153p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Research programs), (*Lithium cooled reactors, Research programs), Corrosion, Electronic equipment, Fuel elements, Lithium, Radiators, Reactor control systems, Reactor instrumentation, Reactor materials, Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31327.

PWAC-583 PC$8.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NUCLEAR PROPULSION PROGRAM ENGINEERING PROGRESS REPORT, JULY 1, 1958--SEPTEMBER 30, 1958.
31 Oct 58, 120p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Research programs), (*Lithium cooled reactors, Research programs), Fuel elements, Reactor control systems, Reactor instrumentation, Reactor materials, Specifications, Testing, Turbojet engines.

For abstract, see NSA 29 12, number 31328.

PWAC-591 PC$9.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NUCLEAR PROPULSION PROGRAM ENGINEERING PROGRESS REPORT, JANUARY 1, 1959--MARCH 31, 1959.
30 Apr 59, 138p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Research programs), (*Lithium cooled reactors, Research programs), Corrosion, Fuel elements, Lithium, Performance, Radiators, Reactor components, Reactor control systems, Reactor instrumentation, Reactor kinetics, Reactor materials, Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31329.

PWAC-592 PC$7.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NUCLEAR PROUPULSION PROGRAM ENGINEERING PROGRESS REPORT, APRIL 1, 1959--JUNE 30, 1959.
30 Jul 59, 114p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Research programs), (*Lithium cooled reactors, Research programs), Fuel elements, Reactor components, Reactor control systems, Reactor instrumentation, Reactor kinetics, Reactor materials, Specifications.

For abstract, see NSA 29 12, number 31330.

PWAC-593 PC$8.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
NUCLEAR PROPULSION PROGRAM ENGINEERING PROGRESS REPORT, JULY 1, 1959--SEPTEMBER 30, 1959.
30 Oct 59, 118p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Research programs), (*Lithium cooled reactors, Research programs), Fuel elements, Reactor control systems, Reactor instrumentation, Reactor kinetics, Reactor materials, Specifications, Turbojet engines.

For abstract, see NSA 29 12, number 31331.

PWAC-622 PC$10.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
LCRE AND SNAP-50-DR-1 PROGRAMS. ENGINEERING PROGRESS REPORT, APRIL 1, 1962--JUNE 30, 1962.
31 Jul 62, 164p
Contract AT(30-1)-2789

Descriptors: (*Lcre reactor, *Research programs), (*S50 reactor, Research programs), Fuel elements, Physical radiation effects, Primary coolant circuits, Reactor kinetics, Reactor materials, Secondary coolant circuits, Shielding, Specifications, Testing.

For abstract, see NSA 29 12, number 31332.

PWAC-623 PC$10.00/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
LCRE AND SNAP-50-DR-1 PROGRAMS. ENGINEERING PROGRESS REPORT, JULY 1, 1962--SEPTEMBER 30, 1962.
31 Oct 62, 158p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Research programs), (*Lcre reactor, Research programs), Fuel elements, Primary coolant circuits, Reactor materials, Secondary coolant circuits, Specifications.

For abstract, see NSA 29 12, number 31333.

PWAC-624 PC$8.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
LCRE AND SNAP 50-DR-1 PROGRAMS. ENGINEERING PROGRESS REPORT, OCTOBER 1, 1962--DECEMBER 31, 1962.
20 Mar 63, 125p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Research programs), (*Lcre reactor, Research programs), Fabrication, Fuel elements, Primary coolant circuits, Reactor kinetics, Reactor materials, Secondary coolant circuits, Specifications.

For abstract, see NSA 29 12, number 31334.

PWAC-631 PC$8.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
LCRE AND SNAP 50-DR-1 PROGRAMS. ENGINEERING PROGRESS REPORT, JANUARY 1, 1963--MARCH 31, 1963.
10 Jun 63, 135p

Descriptors: (*S50 reactor, *Research programs), (*Lcre reactor, Research programs), Fabrication, Fuel elements, Primary coolant circuits, Pumps, Reactor instrumentation, Reactor materials, Specifications, Steam generators.

For abstract, see NSA 29 12, number 31335.

PWAC-632 PC$10.75/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
LCRE AND SNAP 50-DR-1 PROGRAMS. ENGINEERING AND PROGRESS REPORT, APRIL 1, 1963--JUNE 30, 1963.
26 Aug 63, 172p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Research programs), (*Lcre reactor, Research programs), Fabrication, Fuel elements, Primary coolant circuits, Pumps, Reactor instrumentation, Reactor kinetics, Reactor materials, Secondary coolant circuits, Specifications, Steam generators.

For abstract, see NSA 29 12, number 31336.

PWAC-633 PC$10.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
LCRE AND SNAP 50-DR-1 PROGRAMS. ENGINEERING PROGRESS REPORT, JULY 1, 1963--SEPTEMBER 30, 1963.
25 Nov 63, 146p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Research programs), (*Lcre reactor, Research programs), Fuel elements, Primary coolant circuits, Pumps, Reactor components, Reactor kinetics, Reactor materials, Shielding, Specifications, Steam generators.

For abstract, see NSA 29 12, number 31337.

TIM-864 PC$7.50/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa). Connecticut Advanced Nuclear Engineering Lab.
PWAR-20 REACTOR (2-MWT) PRELIMINARY NUCLEAR ANALYSIS.
W. G. Alwang, H. Johnson, and E. Paradis. 1 Dec 64, 89p
Contract AT(30-1)-2789

Descriptors: (*S50 reactor, *Reactor kinetics), Gamma radiation, Neutron flux, Power density, Reactivity worths, Reactor cores, Specifications, Temperature coefficient.

For abstract, see NSA 29 12, number 31338.

WANL-TNR-137 PC$13.00/MF$1.45
Westinghouse Electric Corp., Pittsburgh, PA. (Usa). Astronuclear Lab.
NRX-A BLOCK I MECHANICAL DESIGN.
Nov 63, 200p

Descriptors: (*Nrx-a2 reactor, *Reactor components), Reactor cores, Reactor kinetics, Shielding, Specifications.

For abstract, see NSA 29 12, number 31339.

XDC-56-10-25 PC$5.75/MF$1.45
General Electric CO., Cincinnati, Ohio (Usa). Aircraft Nuclear Propulsion Dept.
SYSTEMS ANALYSIS AND ECONOMIC OPTIMIZATION OF NUCLEAR ROCKET POWER PLANTS.
J. L. Hartman. 30 Sep 56, 71p

Descriptors: (*Space propulsion reactors, *Cost), Economics, Optimization, Performance, Specifications.

For abstract, see NSA 29 12, number 31340.

19. ORDNANCE

19A. Ammunition, Explosives, and Pyrotechnics

AD-780 011/3GA PC$4.50/MF$1.45
Frankford Arsenal Philadelphia Pa
AN ASSESSMENT OF TEST ENVIRONMENTS FOR THE STRESS CORROSION CRACKING OF SMALL CALIBER BRASS CARTRIDGE CASES.
Technical research rept.,
Deborah J. Owen. Jan 74, 26p Rept no. FA-M74-1-1

Descriptors: *Cartridge cases, *Stress corrosion, *Safety, Brass, Cracking(Fracturing), Test methods, Pollution, Abatement, Vapors, Solutions(Mixtures), Ammonia.
Identifiers: Mattsson solution.

Non-polluting and non-toxic stress corrosion testing methods, applicable to brass cartridge cases, are evaluated as potential alternates for the mercurous nitrate method. In this assessment, rapidity and reliability of indicating stress corrosion susceptibility are important considerations. Included are: vapor tests - specimens over ammonium hydroxide, ammonium carbonate, or various organic amine liquids; solution tests - specimens immersed in ammonium hydroxide, devoid of or containing hydrogen peroxide, in amine liquids, or in Mattsson's solution. Stressed or stress-relieved specimens are employed. The results of these experiments are compared to those of the mercurous nitrate test. Specific conclusions are rendered concerning the ammonia vapor and the Mattsson test methods, and a recommendation is made concerning modifying the Mattsson test method. (Author)

AD-780 012/1GA PC$3.25/MF$1.45
Army Missile Command Redstone Arsenal Ala Guidance and Control Directorate
THE EFFECT OF APPLIED MAGNETIC FIELDS ON THE PAUSE TIME PHENOMENON OF EXPLODING WIRES.
Technical rept.,
D. Holder. Apr 74, 34p Rept no. RG-74-22

Descriptors: *Exploding wires, *Magnetic fields, Magnetic pinch, Electric arco, Curve fitting, Graphics.

The report covers experimental work performed on the processes of a wire undergoing electrical explosion. The object was to explore the effects of an externally-impressed magnetic field. The external field was applied in two different manners: transversely (arc blow-out fashion) and axially (magnetic pinch fashion). The particular process of interest is that phenomenon termed 'dark pause'. The span of this pause is measured and compared for the same size wire sample for each field orientation. (Author)

AD-780 014/7GA PC$3.25/MF$1.45
Frankford Arsenal Philadelphia Pa
FAILURE ANALYSIS OF GEARLESS SAFETY AND ARMING DEVICE.
M. Jerry Kenig. Nov 73, 26p Rept no. FA-M73-34-1

Descriptors: *Projectile fuzes, *Arming devices, Fuze functioning elements, Safety and arming(Ordnance), Dynamic response, Structural response, Stresses, Mathematical analysis.
Identifiers: Failure analysis.

A malfunction has been observed in the time delay arming system for the device investigated at spin speeds above 13,000 rpm. A quasi static and dynamic analysis of the system was made to determine the cause and measures for correction. The primary cause of failure was determined to be low cycle fatigue of the mating surfaces of the rotor and balance caused by the high bearing pressures at the point of contact. The recommendation for correction is to decrease the bearing pressure by decreasing the inertia (i.e., mass) of the rotor and balance. A mathematical analysis for rationally predicting life is included. Alternative approaches and the problem of 'run-in' are also discussed. A stress analysis of the rotor teeth is provided. (Author)

AD-780 028/7GA PC$3.00/MF$1.45
Harry Diamond Labs Washington D C
POWER SUPPLIES FOR ORDNANCE FUZING,
Asaf A. Benderly. Feb 74, 16p Rept no. HDL-TM-74-2

Descriptors: *Electric fuzes, *Power supplies, Electric batteries, Fuel cells, Radioisotope batteries, Thermoelectricity, Fluidics, Piezoelectric materials.

The report describes the types of power supplies considered for ordnance fuzing, their capabilities, the state-of-the-art, and the recommended approaches for these fuzing applications, based on a recent consensus by the fuze power-supply community.

AD-780 064/2GA PC$3.25/MF$1.45
Ballistic Research Labs Aberdeen Proving Ground Md
THE DESIGN OF A SECOND GENERATION YAWSONDE.
Memorandum rept. (Final),
William H. Mermagen, and Wallace H. Clay. Apr 74, 33p Rept no. BRL-MR-2368

Descriptors: *Projectile trajectories, *Telemeter systems, *Yawsondes, Optical detectors, Solar cells, Amplifiers, Signal processing, Onboard, Data reduction, Experimental design.

Improvements have been incorporated into existing yawsonde telemeters to facilitate ground reduction of extensive quantities of data. The main area of improvement has been in the design of the amplifier so that solar pulses of constant amplitude and constant width can be transmitted to ground receiving stations. The new amplifier design makes it possible to reduce the solar pulse data on board the projectile itself providing solar aspect angle as a function of time of flight in binary coded form at the transmitter. Sucn onboard, real time motional data could be used in a command/control system to enhance the accuracy of artillery fire. (Author)

AD-780 170/7GA PC$4.00/MF$1.45
Avco Precision Products Div Richmond Ind
PRODUCT IMPROVEMENT AND ADVANCED PRODUCTION ENGINEERING OF THE M550 FUZE.
Final rept. Apr 72-Feb 74,
George T. Keller. Mar 74, 100p
Contract DAAA21-72-C-0566

Descriptors: *Fuzes(Ordnance), Manufacturing, Fuze functioning elements, Fabrication, Automation, Production control, Production engineering, Specifications.
Identifiers: M-550 fuzes.

The objective of the program was to design, develop, fabricate and debug a prototype M550 Fuze assembly line that will be capable, when balanced, of producing 250,000 fuzes per month on a 1-8-5 shift basis. This contract did not require that the line be balanced for a true 1-8-5 shift basis at this time. The prototype line was acquired and installed, with production beginning on a separate contract almost immediately. Appendices are included covering a verbal description of each machine's function; a sample purchase description; listing of operation and maintenance manuals, and a list of drawings for the assembly and test machines; operating instructions for the test machines; and a comment on automated line production through February 1974 and suggested improvements. (Author)

SLA-74-5073 PC$3.50/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
DETONATION TRANSFER BY FLYER PLATE IMPACT.
J. E. Kennedy, and A. C. Schwarz. 1974, 28p
CONF-740216-1

Descriptors: (*Explosives, *Impact shock), Acceleration, Explosions, Impedance, Plates, Pressure dependence, Solids, Velocity.

For abstract, see NSA 29 12, number 31663.

19B. Bombs

AD-779 829/1GA PC$4.75/MF$1.45
Naval Ammunition Depot Crane Ind
HUMAN FACTORS ENGINEERING DESIGN OF THERMAL BOMB PRODUCTION LINE,
Mark S. Sanders. 1 Sep 73, 137p Rept no. NAD-CR-RDTR-254

Descriptors: *Bombs, *Industrial production, *Human factors engineering, Production control, Safety, Work, Job analysis, Performance(Human), Environmental engineering.

Human factors analysis of production of 500 lb. thermally protected bombs was conducted. Specific defects in the target production line were identified, and corrective measures were recommended. Several environmental hazards were described, including excessive noise and heat. Problems identified were photographically documented where possible. (Author)

19C. Combat Vehicles

AD-780 127/7GA PC$4.75/MF$1.45
Chrysler Corp Detroit Mich Defense Engineering
CONCEPT FEASIBILITY COMBAT TRACKED VEHICLE SIGNATURE DUPLICATOR.
Final technical rept. 23 May 73-15 Mar 74,
Burton D. Jones, and Gerald T. Cohron. 15 Mar 64, 133p
Contract DAAK02-73-C-0364

Descriptors: *Tracked vehicles, *Mine clearance, Land mines, Soils, Trafficability, Suspension devices, Offroad traffic, Experimental design.
Identifiers: Finite element analysis, *Ride dynamics.

The report presents the results of an investigation of the feasibility of a specialized tracked vehicle for application in certain mine-clearing missions. The concept depends on the redundancy of a quad-track, quad-drive locomotion system for the capability to continue operation after one or more mine detonations. (Modified author abstract)

19D. Explosions, Ballistics, and Armor

AD-779 802/8GA PC$3.75/MF$1.45
Stanford Research Inst Menlo Park Calif
INVESTIGATION OF LOW-VELOCITY DETONATION PHENOMENA IN LIQUID MONOPROPELLANTS AND EXPLOSIVES.
Final rept.,
Michael Cowperthwaite, and David C. Erlich. Feb 74, 71p AFOSR-TR-74-0801
Contract F44620-73-C-0034

Descriptors: *Monopropellants, *Explosives, *Detonations, Liquid propellants, Explosion bubbles, Shock waves, Cavitation, Reaction kinetics.
Identifiers: LVD(Low Velocity Detonations), Low velocity detonations.

Theoretical and experimental studies were conducted to gain a basic understanding of low-velocity detonation (LVD) in confined energetic liquids. The main objective of the theoretical study was to develop satisfactory models for the initiation and propagation of LVD. LVD was modeled as a reactive shock discontinuity propagating in a liquid cavitated by liquid-wall interactions. A study of Hugoniot curves and numerical calculations on burning bubbles were undertaken to determine the amount of reaction required to support the wave. (Modified author abstract)

AD-779 837/4GA PC$3.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
DYNAMIC CHARACTERISTICS OF SEISMIC WAVES DURING UNDERGROUND EXPLOSIONS,
B. G. Rulev. 19 Apr 74, 70p Rept no. FTD-MT-24-390-74
Edited machine trans. of Vzryvnoe Delo (USSR) n64/21 p109-158 1968, by Ray E. Zarza.

Descriptors: *Underground explosions, *Seismic waves, *Seismic detection, Ground motion, Clay, Stresses, Deformation, USSR, Translations.

AD-779 919/0GA PC$5.75/MF$1.45
Air Force Weapons Lab Kirtland AFB N Mex
DIHEST IMPROVEMENT PROGRAM TEST DIP IIIA.
Final rept. 1 Jan 72-30 Aug 73,
Donald R. Schlater. Apr 74, 213p Rept no. AFWL-TR-74-16

Descriptors: *Explosion effects, *Seismic waves, *Soil mechanics, *Ground motion, Nuclear explosions, Simulation, Graphics, Curve fitting, New Mexico.
Identifiers: DIHEST(Direct Induced High Explosive Simulation Technique), Direct induced high explosive simulation technique.

Ground motion data are presented from Project DIP IIIA, the third experiment in the DIHEST Improvement Program (DIP) Series. The experiment, fired 20 May 1972 near Albuquerque, New Mexico, was designed to measure velocity, acceleration, displacement, soil stress, and blast pressure from the detonation of a 6600-pound buried, decoupled Direct-Induced High-Explosive Simulation Technique (DIHEST) array of slurry explosive. Rear boundary relief was provided on the east side of the array in the form of a long deep trench situated 100 feet away and parallel to the explosive array. On the west side of the array the boundary relief consisted of two rows of deep 4-foot diameter holes. The free-field ground motion instruments were installed 5 to 60 feet deep in 12-inch diameter holes in a rectilinear array at distances of 16 to 90 feet from the plane of the explosive array. Plots of the electronic data traces are presented. The response of four buried cylindrical research structures to the explosion is also reported. (Author)

AD-780 030/3GA PC$3.25/MF$1.45
General Electric Co Philadelphia Pa Space Div
INFRARED VIDICON OBSERVATIONS OF EXPLODING BALLOON EVENTS.
Final technical rept. 1 Nov 73-15 Mar 74,
F. Alyea, R. Gulatsi, and G. Liebling. Apr 74, 38p
RADC-TR-74-145
Contract F30602-73-C-0102
Sponsored in part by Advanced Research Projects Agency, Arlington, Va. See also AD-772 754.

Descriptors: *Balloons, *Explosive gases, Explosion bubbles, Explosions, Airburst, Infrared scanning, Infrared optical systems, Vidicons, Detonations, Methane, Oxygen.

Identifiers: GEST project.

During the month of December 1973, the Air Force Weapons Laboratory (AFWL) conducted a series of experiments as part of Project GEST (Gas Explosive Simulation Technique) to evaluate the flow characteristics of fireballs resulting from balloon explosions. The tests were conducted at Kirtland Air Force Base, New Mexico and consisted of detonating tethered balloons filled with an explosive mixture of CH4 and O2. The principal objective in these tests is to study the characteristics of torus formation, including formation rate, size, rate of rise, temperature profiles, etc. (Modified author abstract)

AD-780 113/7GA PC$3.25/MF$1.45
Illinois Univ Urbana Dept of Aeronautical and Astronautical Engineering
ON THE NATURE OF NON-IDEAL BLAST WAVES.
Technical rept.,
Roger A. Stehlow, and Andrew A. Adamczyk. Apr 74, 39p Rept nos. AEE-74-2, UILU-ENG-74-0502 AFOSR-TR-74-0834
Grant AF-AFOSR-2524-73

Descriptors: *Explosions, *Blast, Detonation waves, Flow fields, Shock waves, Numerical integration.
Identifiers: Method of characteristics.

Contained herein are a description of a model and a calculation procedure for planar, cylindrical or spherical geometries used to predict the flow-field parameters for non-steady, non-ideal blast waves, generated by the deposition of energy over a known temporal and spatial regime. This modeling consists of adding energy into a constant heat capacity gas and numerically integrating the equations of motion using a constant time-step method of characteristics, with appropriate initial and boundary conditions. Two non-dimensional parameters are presented which relate similar non-ideal energy sources and predict that their limit behaviors should approach an ideal point source on one hand and the source which generates a propagating acoustic wave on the other. (Modified author abstract)

AD-780 199/6GA PC$4.75/MF$1.45
Weidlinger Associates New York
GROUND MOTION CALCULATIONS FOR EVENTS II AND III OF THE MIDDLE GUST SERIES.
Topical rept. 31 Jan 73-31 Jan 74,
Ivan S. Sandler, Joseph P. Wright, and Melvin L. Baron. 5 Apr 74, 150p DNA-3290T
Contracts DNA001-72-C-0003, DNA001-73-C-0023

Descriptors: *Ground motion, *Airburst, *Explosion effects, Ground shock, Loads(Forces), TNT, Soil mechanics, Mathematical models, Stresses, Cratering, Failure(Mechanics), Simulation, Nuclear explosions, Displacement, Correlation techniques.
Identifiers: MIDDLE GUST operation.

Results are presented from ground motion calculations of Events II and III of the MIDDLE GUST test series. The calculations were performed using large and small strain versions of the LAYER code in which the material behavior of the ground was described and fit by means of a cap model and the surface loading was fit to a calculation of Needham. The results of the computations are compared to gauge records obtained in the field events. The calculated crater dimensions and peak air-blast-induced motions, particularly in the vertical direction, and in reasonable agreement with the field data, while other features of the motion, particularly waveforms, are not as well represented in the calculations. The reasons for the discrepancies are discussed and some points of interest for future study are indicated. (Author)

AD-780 311/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SOME RESULTS OF THE STUDY OF THE INFLUENCE OF STRENGTH ON THE EFFECT OF AN EXPLOSION IN A SOLID,
V. N. Rodionov, V. M. Tsetkov, and P. V. Sporanskii. 24 May 74, 15p Rept no. FTD-HT-23-917-74
Edited trans. of mono. Problema Razruzheniya Gornykh Porod Vzryvom, n.p., 1967 p15-21, by Ray E. Zarza.

Descriptors: *Explosions, Rock, Cavities, Explosive charges, Particle size, Translations, USSR.
Identifiers: *Camouflets.

AD-780 345/5GA PC$3.00/MF$1.45
Defence Research Establishment Valcartier Quebec
A SEMICONDUCTOR SKYLIGHT OPTICAL SCREEN FOR PROJECTILE DETECTION,
J. M. Cruickshank. Feb 74, 22p Rept no. DREV-TN-2100/74
Summary in French.

Descriptors: *Projectiles, *Optical detectors, Photodetectors, Photodiodes, Muzzle velocity, Retarding, Canada.

The Note presents the design, detection capabilities, and testing of a wide-angle skylight optical screen primarily intended for use in the measurement of projectile velocity and retard on outdoor ranges. Semiconductor electronics have enabled the construction of a unit ideally suited for use in remote areas where it is advantageous to employ a light, easily portable instrument designed for operation from either a low voltage battery source or 100 VAC power line. (Author)

AD-780 360/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE REACTION OF A FIBERGLASS CYLINDRICAL SHELL TO THE ACTION OF A BLAST LOAD,
A. A. Naida, and V. K. Ovchinnikov. 19 Apr 74, 14p Rept no. FTD-HT-23-1488-74
Edited trans. of Prikladnaya Mekhnika (USSR) v8 n9 p20-25 1972, by Ray E. Zarza.

Descriptors: *Shells(Structural forms), *Fiberglass, *Blast, Loads(Forces), Detonations, Bending, Reaction kinetics, Translations, USSR.
Identifiers: *Cylindrical shells, *Blast loading.

AD-780 429/7GA PC$4.00/MF$1.45
Naval Ordnance Lab White Oak Md
THE NOL LARGE SCALE GAP TEST. III. COMPILATION OF UNCLASSIFIED DATA AND SUPPLEMENTARY INFORMATION FOR INTERPRETATION OF RESULTS.
Final rept.,
Donna Price, A. R. Clairmont, Jr., and J. O. Erkman. 8 Mar 74, 89p Rept no. NOLTR-74-40
Supersedes rept. no. NOLTR-65-177, AD-368 687-L.

Descriptors: *Explosives, *Explosions, Explosive charges, Test facilities, Critical assemblies, Sensitivity.
Identifiers: *Gap tests.

The objectives of this report are to bring up to date the compilations of all unclassified NOL large-scale gap test (LSGT) results, to describe exactly the present standardized test, and to review or report all NOL studies made on the test or modifications of it. The topics presented included standardized test procedure, best test calibration, effect of temperature and porosity on sensitivity, and the effect on test values of modifying the test. A comparison between the NOL large scale and small scale gap test values is given, and also the relationship of the former to the wedge test data. Finally an appendix is devoted to the compilation of critical diameter (dc) measurements and to showing that there is no general relationship betwen the LSGT results and dc. (Author)

AD-780 434/7GA PC$3.25/MF$1.45
Civil Engineering Lab (Navy) Port Hueneme Calif
INFLUENCE OF SOIL-ROCK INTERFACE ON DYNAMIC RESPONSE OF BURIED CYLINDERS.
Final rept. Oct 72-Jun 73,
R. N. Murtha. May 74, 30p Rept no. CEL-TR-809
Report on Support of Project Sanguine.

Descriptors: *Underground structures, *Blast, *Soil dynamics, Elastic waves, Wave propagation, Soils, Soil mechanics, Stresses.
Identifiers: Structure soil interactions, Sanguine project.

The study was initiated to determine the influence of an underlying rock interface on the response of buried cylinders to blast loading. Static and dynamic tests were conducted on eight different 6-inch-diameter steel cylinders buried horizontally in a dense, dry sand. The major variables were the cylinder thickness and the location concrete bottom. Measurements were made of hoop strain, vertical diameter changes, and accelerations of the cylinder; free-field stress, strain, and acceleration of the soil; and surface overpressure. (Modified author abstract)

AD-780 525/2GA PC$3.75/MF$1.45
Little (Arthur D) Inc Cambridge Mass
INCORPORATION OF AN INTERNAL DATA VALIDATION PROCESS AND AN INTERVAL ESTIMATION CAPABILITY WITHIN THE AFCRL ROCKET TRAJECTORY SYSTEM.
Final rept.,
William R. Schonbein. Nov 73, 53p Rept no. ADL-C-75276 AFCRL-TR-74-0186
Contract F19628-73-C-0026

Descriptors: *Rocket trajectories, Kalman filtering, Differential equations, Matrices(Mathematics), Curve fitting, Numerical integration.

The report describes the mathematical methods required to incoroporate within the AFCRL Rocket Trajectory System both an internal data validation process and, as an option, an interval estimation capability. The introduction of equations, of powered flight and card input data accuracy requirements are also discussed. (Author)

FPR-1-74 PC$3.25/MF$1.45
Ukaea Weapons Group, Foulness. Atomic Weapons Research Establishment.
AL/WATER SHOCK TUBE EXPERIMENTS AT AWRE, FOULNESS SINCE JANUARY 1972.
J. N. Guest, R. G. Turner, and N. J. M. Rees. Jan 74, 21p CONF-731126-2, TRG-Memo-6415

Descriptors: (*Aluminium, *Explosions), (*Water, Explosions), Chemical reactions, Heat transfer, Liquid metals, Shock tubes, Vapors.

For abstract, see NSA 29 12, number 29242.

ORO-3936-11 PC$12.00/MF$1.45
Houston Univ., Tex. (Usa). Dept. Of Mechanical Engineering.
VAPOR EXPLOSION: HEAT TRANSFER AND FRAGMENTATION. VII. MOLTEN-METAL/WATER INTERACTIONS PRIOR TO A VAPOR EXPLOSION.
K. H. Hsiao, J. E. Cox, and L. C. Witte. Jan 74, 176p
Contract AT(40-1)-3936

Descriptors: (*Liquid metals, *Explosions), (*Water, Explosions), Boiling, Heat transfer, Vapors.

For abstract, see NSA 29 12, number 29243.

19E. Fire Control and Bombing Systems

AD-779 909/1GA PC$7.25/MF$1.45
Naval Air Development Center Warminster Pa
SPECIFICATION FOR VISUAL TARGET ACQUISITION SYSTEM AN/AVG-8A (XJ-1) (U) FLIGHT TEST PROGRAM INTERFACE CONTROL DOCUMENT SH 4506-02-73.
5 Oct 73, 83p

Descriptors: *Target acquisition, *Aircraft fire control systems, Fire control systems, Guided missiles, Specifications, Jet fighters, Avionics, Interfaces, Installation, Weapon systems, Air to air missiles.
Identifiers: AN/AVG-8A, F-14 aircraft, F-14A aircraft, AN/AWG-9, AIM-9 missiles, Sidewinder.

The document establishes and controls the specific technical criteria for the installation of the AVG-8A Visual Target Acquisition System (VTAS) into the F-14A Weapon System on Aircraft Buno. TBD. The items covered are limited to those where control of the interface is necessary for the aircraft contractor, the F-14A Weapon Control System Contractor and the AVG-8A contractor to perform their respective tasks.

AD-780 081/6GA PC$4.25/MF$1.45
Army Test and Evaluation Command Aberdeen Proving Ground Md Systems Analysis Directorate
METHODOLOGY INVESTIGATION: TECHNICAL EVALUATION OF FIELD ARTILLERY DIGITAL AUTOMATIC COMPUTER (FADAC) TAPES.
Final rept.,
Donald H. McCoy. 13 Aug 73, 23p Rept no. SY-73-2

Descriptors: *Artillery, *Fire control computers, *Tapes, Digital computers, Input output processing, Ballistic testing, Computer programs.
Identifiers: FADAC computer program.

The study was conducted by the Systems Analysis Directorate of Headquarters, US Army Test and Evaluation Command, for the purpose of demonstrating the need and feasibility of complete technical testing of revised FADAC tapes. Better technical testing was shown to be feasible and desirable. Recommendations were made to have Frankford Arsenal conduct completely automated technical tests. (Author)

19F. Guns

AD-780 056/8GA PC$3.25/MF$1.45
Watervliet Arsenal N Y
EFFECT OF SURFACE PROFILES ON CHARACTERISTICS OF CONCENTRIC RECOIL BEARINGS.
Technical rept.,
Robert S. Montgomery. Jun 74, 27p Rept no. WVT-TR-74013

Descriptors: *Tanks(Combat vehicles), *Guns, *Recoil mechanisms, *Antifriction bearings, Lubricating oils, Recoil.
Identifiers: M-81 guns(152-MM), M-551 vehicles, Sleeve bearings.

An object of the design of a concentric recoil bearing is to insure reliable full-film lubrication over as much of the recoil and counter recoil motions as possible. The surface profile has a great effect on the oil film produced in the bearing. A straight bearing profile produces only a thin and unreliable film. A small taper on the leading edge greatly improves the situation. However, a shallow blind pocket in the loaded sector of the bearing was the best surface profile of those studied. Although the pocket was less than a mil deep, it resulted in a faster acting bearing and an appreciable thicker oil film. At the highest bearing pressure, the 10 millisecond film thickness was almost twice that of the next best profile studied. (Author)

19G. Rockets

AD-780 046/9GA PC$4.75/MF$1.45
Human Engineering Lab Aberdeen Proving Ground Md
THE EFFECTS OF WEIGHT AND LENGTH ON THE PORTABILITY OF ANTITANK SYSTEMS FOR THE INFANTRYMAN.
Technical memo.,
James P. Torre, Jr. Oct 73, 134p Rept no. HEL-TM-20-73

Descriptors: *Antitank weapons, *Portable equipment, Lightweight, Infantry, Human factors engineering, Questionnaires.
Identifiers: M-72 Rocket launchers(66-MM), SMAWT program.

A field study was conducted to determine the effect of weight and length of an antitank system on the performance of an infantryman. A portability test course was designed and constructed. The ability of soldiers from the 82d Airborne Division to negotiate the course was measured and the soldiers' ratings of each of the systems they carried were obtained. Functional relationships between weight, length and performance were obtained with an indication of the effects of volume, i.e., multiple carry. The test soldiers were able to discriminate among the loads using the bipolar adjective rating technique, and for what appears to be a reluctance-to-carry factor, tended to rate the loads carried in a manner which parallels the performance findings. The infantryman's performance degrades and he is reluctant to carry 81mm antitank systems longer than 31 inches (at eight pounds) and heavier than eight pounds when added to his current fighting load. (Author)

AD-780 337/2GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIMENTAL INVESTIGATION OF A TURBULENT BOUNDARY LAYER ON A GREATLY ELONGATED BODY OF REVOLUTION IN A SUPERSONIC FLOW,
V. M. Kovalenko, N. I. Nesterovich, and V. M. Shulemovich. 24 May 74, 12p Rept no. FTD-HT-23-1280-74
Edited trans. of Akademiya Nauk SSSR. Sibirskoe Otdelenie. Izvestiya. Seriya Tekhnicheskikh Nauk, n8 p41-46 1972, by Catherine M. Barber.

Descriptors: *Sounding rockets, *Turbulent boundary layer, Supersonic flow, Bodies of revolution, Wind tunnel models, Translations, USSR.

20. PHYSICS

20A. Acoustics

AD-779 876/2GA PC$3.00/MF$1.45
Naval Research Lab Washington D C
RANDOM FREQUENCY FUNCTION GENERATION.
Interim rept.,
A. A. Gerlach. 30 Apr 74, 20p Rept no. NRL-7697

Descriptors: *Sound transmission, *Underwater sound, Signal processing, Power spectra, Pseudo random systems, Probability density functions, Information theory, Signal generators.
Identifiers: Random functions, *Function generators.

The desired signature characteristics of the source generator for use on a long-range acoustic propagation experiment are defined. A programmable frequency function is proposed, consisting of slowly varying frequency undulations whose rate and magnitudes are pseudo-randomly distributed. The power spectral density and other significant properties of the frequency function are derived and displayed in both tabular and graphical form. A method is presented of implementing the random frequency function generator which uses a digital programmable read-only memory as its central element. The function generator is simple and reliable in concept and circuit, and should find application in a variety of underwater acoustic experiments. (Author)

AD-780 073/3GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
ASYMPTOTIC THEORY OF PROPAGATION IN CURVED AND NONUNIFORM WAVEGUIDES.
Scientific interim rept. no. 3,
D. S. Ahluwalia, J. B. Keller, and B. J. Matkowsky. 1 Sep 73, 9p
Contract N00014-67-A-0467-0027, Grant AF-AFOSR-2107-71
Prepared in cooperation with Rennselaer Polytechnic Inst., Troy, N.Y. Dept. of Mathematics, and University of South Florida, Tampa. Dept. of Mathematics.
Availability: Pub. in Jnl. of the Acoustical Society of America, v55 n1 p7-12 Jan 74.

Descriptors: *Acoustic waves, *Waveguides, Ray tracing, Wave propagation.

To treat guided wave propagation in curved nonuniform waveguides, such as atmospheric, oceanic, and solid earth ducts, two methods of analysis are presented. The first is the ray method of Keller and Rubinow, which has been applied to waveguides by Maurer and Felsen. This method is illustrated by applying it to a straight uniform guide, for which it yields the exact result. It is also applied to a guide with concentric circular walls, and yields the asymptotic form of the exact result. Then it is applied to a gradually changing guide and yields a result which includes that of Rayleigh for narrow guides. The second method, which involves stretching of the transverse coordinate, has been applied to water waves by Keller to narrow guides by Matkowsky and to various guided wave problems by Rulf. It is applied to gradually changing guides and yields results which are more accurate than the ray method results for such guides. (Author)

AD-780 078/2GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
HORIZONTAL RAY THEORY FOR OCEAN ACOUSTICS.
Scientific interim rept.,
Henry Weinberg, and Robert Burridge. 15 Jun 73, 20p Rept no. NYU-ONR-H54
Contract N00014-67-A-0467-0006
Prepared in cooperation with Naval Underwater Systems Center, New London, Conn.
Availability: Pub. in Jnl. of Acoustical Society of America, v55 n1 p63-79 Jan 74.

Descriptors: *Underwater sound, *Ray tracing, Sound transmission, Wave equations, Stratification, Ocean models, Transmission loss.

The solution of the reduced scalar wave equation for an almost stratified medium is written in the form of an asymptotic power series. The vertical structure of the solution is expressed as a linear combination of the normal-mode eigenfunctions whose coefficients satisfy two-dimensional eikonal and transport equations. Although smooth caustics may be treated for the two-dimensional scalar wave equation, the problem of a uniform approximation near a point source has not yet been resolved. Finally, the theory is applied to acoustic propagation in a realistic model ocean and the results are compared with measurements. (Author)

AD-780 156/6GA Not available NTIS
Defence Research Establishment Pacific Victoria (British Columbia)

SEASONAL, GEOGRAPHICAL, AND SPECTRAL DEPENDENCE OF VOLUME SCATTERING STRENGTH IN THE GULF OF ALASKA,
R. G. Turner. 1973, 19p Rept no. DREP-Reprint-74-6
Availability: Pub. in U.S. Navy Jnl. of Underwater Acoustics, v23 n4 p437-453 Oct 73.

Descriptors: *Underwater sound, *Acoustic scattering, *Alaska Gulf, Backscattering, Spectrum analysis, Seasonal variations, Canada.

The paper describes the distribution of volume scattering strength throughout the area of the Gulf of Alaska east of 150 degrees W longitude, and the variations that accompany the seasonal change from September to April.

AD-780 269/7GA PC$5.75/MF$1.45
Utah Univ Salt Lake City Dept of Mathematics
ASYMPTOTIC WAVE FUNCTIONS AND ENERGY DISTRIBUTIONS FOR THE D'ALEMBERT WAVE EQUATION.
Technical summary rept. no. 24,
Calvin H. Wilcox. Mar 74, 55p
Contract N00014-67-A-0325-0006

Descriptors: *Acoustic waves, *Underwater sound, *Wave equations, Wave functions, Hilbert space, Asymptotic series, Approximation, Theorems.
Identifiers: D'Alembert equation.

The classical wave equation of d'Alembert has the form D(sub 0, sup 2)u - (D(sub 1, sup 2)u + D(sub 2, sup 2)u + ... + D(sub n, sup 2)u) = 0, where u = u(t,x) belongs to R, t belongs to R, x = (x sub 1, x sub 2,....,x sub n) belongs to (R sup n), (D sub 0) = partial d/dt and (D sub k) = partial d/d(x sub k) for k = 1,2,...,n. The equation provides the oldest and simplest model for acoustic wave propagation in a homogeneous isotropic fluid. The paper deals with solutions of the equation for which the energy integral is finite. (Modified author abstract)

AD-780 396/8GA Reprint
Sibley School of Mechanical and Aerospace Engineering Ithaca N Y
THE ACOUSTIC FAR-FIELD OF RIGID BODIES IN ARBITRARY MOTION,
F. Farassat. 23 Aug 73, 21p AFOSR-TR-74-0830
Contract F44620-69-C-0063
Revision of report dated 8 May 73.
Availability: Pub. in Jnl. of Sound and Vibration, v32 n3 p387-405 1974.

Descriptors: *Helicopter rotors, *Aerodynamic noise, Acoustics, Far field, Sound pressure, Flow fields.

The far-field sound produced by a rigid body in arbitrary motion, with shock discontinuities close to the body, is studied. The analysis is based on the work of Ffowcs Williams and Hawkings. An expression for the far-field sound pressure is obtained in the form of surface and line integrals carried out over a contracting sphere and its intersection with the body and shock surfaces. It is also found that in addition to the quadrupole distribution, the discontinuities in lighthill stress at the shock, the fluid stresses at the body surface, and the curvatures (principal and mean) of the body and shock surfaces contribute to the sound field. Two examples are worked out. (Author)

AD-780 414/9GA PC$3.25/MF$1.45
Naval Medical Research Inst Bethesda Md
A SET OF TABLES OF THE RELATIVE SPEED OF SOUND IN VARIOUS DIVING GAS MIXTURES.
Medical research progress rept. no. 1,
Michael J. Ackerman, and Georgia Maitland. Mar 74, 41p

Descriptors: *Acoustic velocity, *Gases, Mixtures, Oxygen, Helium, Nitrogen, Neon, Air, Divers, Tables(Data), Computer programs, Speech recognition.

Since the frequency spectrum of a voice signal is directly dependent on the velocity of sound, studies of speech spectra include the problem of calculating the speed of sound in the gas mixture being used. The present program has developed computer-generated tables designed to provide a standard reference for reporting spectral shifts in speech due to different gas mixtures under normal diving conditions. (Author)

AD-780 484/2GA Reprint
Texas Univ Austin Applied Research Labs
ACOUSTIC SATURATION OF SPHERICAL WAVES IN WATER,
Jack A. Shooter, Thomas G. Muir, and David T. Blackstock. 10 Jan 73, 12p AFOSR-TR-74-0873
Contract F44620-71-C-0015
Availability: Pub. in Jnl. of the Acoustical Society of America, v55 n1 p54-62 Jan 74.

Descriptors: *Underwater sound, Sound transmission, Saturation, Waveforms, Fresh water, Salt water.
Identifiers: Spherical waves.

Saturation of spherical waves in water is treated in this paper. An historical review is followed by a theoretical analysis. First, formulas and design curves are presented that are useful in estimating whether saturation can occur under any given conditions. Second, expressions for the saturation amplitude itself are given. Experiments carried out in a fresh water lake to test the theoretical predictions are then described. The measurements were made in the radiation field of a circular piston projector. The paper closes with a discussion of the application of this work to underwater sound propagation.

PB-232 626/2GA PC$5.50/MF$1.45
Illinois Inst. of Tech., Chicago. Dept. of Mechanics, Mechanical and Aerospace Engineering.
NOISE INVESTIGATION OF A RAILROAD DIESEL ENGINE.
Interim technical rept. no. 1,
Narayan S. Srivastava, and Sudhir Kumar. May 74, 195p IIT-TRANS-74-1
Contract DOT-OS-40103

Descriptors: *Diesel locomotives, *Diesel engines, *Engine noise, Cross correlation, Vibration, Noise(Sound), Acoustic measurement.

This study presents an investigation of noise generated by the vibration of structural components of a railroad diesel engine of the GM 645 E Series. A method of correlating the vibrations of certain high vibration components of any machinery with its total noise field has been developed. This method can be applied to a close semi-reverberant field in the presence of multiple noise sources of similar character. Furthermore, percentage contribution to the total noise from the individual structural components can be determined. One third octave band analyses of the effective engine noise and measured vibrations of the engine components have been performed. These vibration and noise signals have been cross-correlated.

20B. Crystallography

AD-779 810/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STRONGER THAN DIAMOND,
A. Khandros. 16 Apr 74, 18p Rept no. FTD-HT-23-1859-74
Edited trans. of Rabochaya Gaseta (USSR) n186 p3, 10 Aug 72, by Joseph E. Pearson.

Descriptors: *Crystal growth, *Diamonds, Synthesis(Chemistry), Translations, USSR.

The paper describes the history of synthetic diamond growth in the USSR.

AD-780 247/3GA PC$3.75/MF$1.45
Isomet Corp Oakland N J
CESIUM DIDEUTERIUM ARSENATE CRYSTAL DEVELOPMENT.
Final rept. 1 Mar 73-31 Mar 74,
Joseph F. Balascio, and Gabriel M. Loiacono. 20 Apr 74, 71p Rept no. TR-134
Contract N00014-73-C-0372, ARPA Order-2364

Descriptors: *Cesium compounds, *Crystal growth, Deuterium compounds, Physical properties, Chemical properties, Solubility, Phase studies, Stability, Single crystals, Light transmission, Thermal stability, Laser beams.
Identifiers: *Cesium arsenates, *Cesium dihydrogen arsenates, Second harmonic generation.

The results on the growth of cesium dideuterium arsenate from aqueous and mixed solvent systems are reported. Particular emphasis had been placed on the analyses of the factors affecting the solution chemistry of CD*A and their affect upon the resultant growth. The phase stability, solubility and supersaturation of CD*A were determined in both solvent systems. Actual deuteration levels in the crystal and aqueous growth solution are reported and discussed. Preliminary data show the mixed solvent system to be very promising for the reproducible growth of high optical quality CD*A. (Author)

AD-780 330/7GA Not available NTIS
National Research Council of Canada Ottawa (Ontario)
TRIPLET EXCITONS AS PROBES FOR STRUCTURAL IMPERFECTIONS IN CRYSTALLINE ANTHRACENE,
D. Goode, Y. Lupien, W. Siebrand, D. F. Williams, and J. M. Thomas. 28 Dec 73, 6p Rept no. NRC-13811
Prepared in cooperation with University Coll. of Wales, Aberystwyth. Edward Davies Chemical Lab.
Availability: Pub. in Chemical Physics Letters, v25 n3 p308-311, 1 Apr 74.

Descriptors: *Anthracenes, *Crystal defects, Emission spectra, Excitons, Fluorescence, Phosphorescence, Crystal lattices, Canada.

The phosphorescence and delayed fluorescence associated with triplet exciton trapping in crystalline anthracene have been used to demonstrate the physical nature of many of the traps and to determine their depth. (Author)

COO-3158-25 PC$3.00/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Materials Science Center.
FACETING OF HIGH ANGLE GRAIN BOUNDARIES IN THE COINCIDENCE LATTICE.
W. R. Wagner, T. Y. Tan, and R. W. Balluffi. 16 Nov 73, 19p
Contract AT(11-1)-3158

Descriptors: (*Crystals, *Grain boundaries), (*Gold, Grain boundaries), Cleavage, Fcc lattices.

For abstract, see NSA 29 12, number 31641.

LBL-2435 PC$3.00/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
VIEW OF THE PRESENT STATUS AND FUTURE PROSPECTS OF HIGH PURITY GERMANIUM.
W. L. Hansen, and E. E. Haller. Nov 73, 16p
CONF-731112-29
Contract W-7405-Eng-48

Descriptors: Aluminium, Crystal growth, Germanium, Impurities, Microstructure, Vacancies.

For abstract, see NSA 29 12, number 31644.

TT-71-58000 PC$5.00/MF$1.45
National Bureau of Standards, Washington, D.C.
LECTURES ON CRYSTAL MORPHOLOGY,
I. I. Shafranovskii. 1973, 168p
Trans. of mono. Lektsii po Kristallomorfologii, Moscow, 1968, by Vijay Pandit. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Crystallography, *Mineralogy, *Books, Translations, USSR.

This book translated from Russian, presents an extensive study of the forms of crystals. The study makes it possible to describe, with mathematical precision, crystal polyhedra as well as complex forms, i.e. skeletal crystals, regular intergrowths, details of structural growth thd dissolution, etc. In addition, the book discusses the dependence of the external form of crystals on their internal structure and the formation of deformed figures under the influence of the surroundings.

20C. Electricity and Magnetism

AD-780 356/2GA Reprint
Rochester Univ N Y Dept of Physics and Astronomy
MULTIPOLE EXPANSIONS AND PLANE WAVE REPRESENTATIONS OF THE ELECTROMAGNETIC FIELD.
Interim rept.,
A. J. Devaney, and E. Wolf. 2 Aug 73, 14p
AFOSR-TR-74-0835
Grant AF-AFOSR-2150-72
Revision of report dated 31 May 73.
Availability: Pub. in Jnl. of Mathematical Physics, v15 n2 p234-244 Feb 74.

Descriptors: *Electromagnetic fields, *Electrodynamics, Fourier transformation, Wave equations.
Identifiers: Spherical harmonics.

A new and conceptually simple derivation is presented of the multipole expansion of an electromagnetic field that is generated by a localized, monochromatic charge-current distribution. The derivation is obtained with the help of a generalized plane wave representation (known also as the angular spectrum representation) of the field. This representation contains both ordinary plane waves, and plane waves that decay exponentially in amplitude as the wave is propagated. The analysis reveals an intimate relationship between the generalized plane wave representation and the multipole expansion of the field and leads to a number of new results. In particular, new expressions are obtained for the electric and magnetic multipole moments in terms of certain components of the spatial Fourier transform of the transverse part of the current distribution. It is shown further that the electromagnetic field at all points outside a sphere that contains the charge-current distribution is completely specified by the radiation pattern (i.e., by the field in the far zone). Explicit formulas are obtained for all the multipole moments in terms of the radiation pattern. (Author)

COO-1248-33 PC$4.50/MF$1.45
Minnesota Univ., Minneapolis (Usa). Particle Technology Lab.
ELECTRICAL CHARGING OF SMALL PARTICLES AT LOW PRESSURES. TENTH PROGRESS REPORT. PARTICLE TECHNOLOGY LABORATORY PUBLICATION NO. 193.
B. Y. H. Liu, and K. T. Whitby. Nov 72, 24p
Contract AT(11-1)-1248

Descriptors: (*Aerosols, Electrostatic charge eliminators), (*Electrostatic charge eliminators, *Performance), Beta sources, Electric charges, Electrostatics, Krypton 85.

For abstract, see NSA 29 12, number 29221.

20D. Fluid Mechanics

AD-780 069/1GA Reprint
California Inst of Tech Pasadena Div of Engineering and Applied Science
SINGULARITIES OF VISCOUS FLOW. PART II. APPLICATIONS TO SLENDER BODY THEORY,
John R. Blake. 2 Nov 73, 15p Rept no. E-97A-31
Contract N00014-67-A-0094-0012, Grant NSF-GK-311161
Revision of report dated 24 Jul 73.
Availability: Pub. in Jnl. of Engineering Mathematics, v8 n2 p113-124 Apr 74.

Descriptors: *Viscous flow, *Slender bodies, Equations of flow, Approximation.

The force and torque on a slender body in Stokes flow is obtained by using a distribution of singularities along the centreline and the required image system to satisfy the no-slip condition and the plane boundary. It is found that the force on a slender body increases rapidly as it approaches within a body length of the boundary, but not the torque. To rule out will effects, experiments on slender bodies, such as flagellated or ciliated micro-organisms, should be carried out a distance of many body lengths (not radii.) from all boundaries. The ratio of normal to tangential resistance coefficients is found to be greater than 2 (the maximum in an infinite fluid) in the presence of walls. (Author)

AD-780 107/9GA PC$3.75/MF$1.45
Tel-Aviv Univ (Israel) School of Engineering
ON TRANSITION IN A PIPE. PART II. THE EQUILIBRIUM PUFF.
Final rept.,
I. Wyganski, M. Sokolov, and D. Friedman. 1974, 51p Rept no. TAU-SOE-94/74 AFOSR-TR-74-0868
Grant AF-AFOSR-2346-72
See also Part 1, AD-773 087.

Descriptors: *Boundary layer transition, *Air flow, *Pipes, Turbulent flow, Reynolds number, Fluid dynamics, Energy transfer, Anemometers, Hot wire, Correlation techniques, Israel.

Conditionally sampled hot wire measurements were taken in a pipe at low Reynolds numbers between 2700 and 2000 corresponding to the onset of turbulence as a result of a large perturbation in the flow. This type of transition gives rise to a turbulent puff which maintains itself indefinitely around Re=2200. The structure of the puff was investigated in some detail and was found to be very different from the structure of the fully developed turbulent pipe flow, nevertheless it is independent of the character to the disturbance which created it. The purpose of the study was to gain some insight into the mechanism of transition in a pipe. (Author)

AD-780 124/4GA PC$3.75/MF$1.45
Technion - Israel Inst of Tech Haifa Dept of Aeronautical Engineering
ON THE TWO-DIMENSIONAL TURBULENT JET.
Interim rept.,
I. Wignanski, and E. Gutmark. 1973, 67p Rept no. TAE-201 AFOSR-TR-74-0870
Grant AF-AFOSR-2346-72

Descriptors: *Jets, *Turbulent flow, Flow fields, Nozzle gas flow, Hot wire, Two dimensional flow, Israel.

Results from hot wire measurements in a plane incompressible jet are reported. The flow was found to be self preserving at distances greater than 40 diameters and measurements were made beyond 120 diameters. The quantities measured include mean velocities, turbulence intensities, third and fourth order terms, as well as two point correlations and intermittency. Conditional sampling techniques were used to obtain data exclusively with the turbulent zone of the jet. The results are compared with previous investigations. This is a third paper in a sequel which provides data on turbulent free shear flows. (Author)

AD-780 228/3GA PC$3.25/MF$1.45
Naval Ship Research and Development Center Bethesda Md
LINEAR DESIGN OF SUPERCAVITATING CASCADE SECTIONS,
Bohyun Yim, and Laurie Higgins. Mar 74, 43p
Rept no. NSRDC-4239

Descriptors: *Cascade structures, *Cavitation, Supercavitating propellers, Pumps, Hydrofoils, Lift to drag ratio, Cavities, Linear programming.
Identifiers: *Supercavitation.

A method for designing two-dimensional supercavitating cascade sections is developed. Linear superposition is used to produce a foil section that has a low drag-to-lift ratio and yet has a reasonably thick cavity. Foils of three elementary pressure distributions are analyzed separately; i.e., a low drag-pressure distribution, a concentrated leading-edge pressure, and a flat plate with angle of attack. The double spiral vortex model is taken for the cavity termination. The pressure distributions are superposed to give the desired lift and cavity thickness for any specified cavity length and cascade geometry. The cavity drag, the cavitation number, and the foil-cavity shape are the main output of the computer program. Cascade parameters are shown to strongly influence the previously mentioned quantities as well as the leading-edge shape. (Author)

AD-780 235/8GA PC$3.25/MF$1.45
Iowa Inst of Hydraulic Research Iowa City
CALCULATION OF THE VISCOUS RESISTANCE OF BODIES OF REVOLUTION,
A. Nakayama, and V. C. Patel. Oct 73, 37p Rept no. IIHR-151
Contract N00014-68-A-0196-0002

Descriptors: *Bodies of revolution, *Drag, Viscous flow, Laminar boundary layer, Boundary layer transition, Turbulent boundary layer, Coefficients.

The flow in the tail region of a body of revolution is a complex one since there the boundary layer often grows to a thickness many times the local radius of the body and there results a strong interaction between the boundary layer and the external potential flow. The influence of making simplifying assumptions concerning the flow in this region in conventional drag-calculation methods is discussed, and assessed by incorporating a method which takes into account the effects of the thick axisymmetric boundary-layer near the tail in an approximate manner. It is shown that this modification leads to a drag-calculation method which gives consistently accurate prediction of the viscous resistance of a wide variety of bodies of revolution. (Author)

AD-780 275/4GA PC$3.00/MF$1.45
Iowa Inst of Hydraulic Research Iowa City
STUDY OF THICK BOUNDARY LAYERS NEAR THE TAIL OF BODIES OF REVOLUTION.
Final rept.,
V. C. Patel. 30 Sep 73, 6p Rept no. IIHR-150
Contract N00014-68-A-0196-0002
See also AD-772 589.

Descriptors: *Bodies of revolution, *Turbulent boundary layer, Viscous flow, Drag, Curvature, Resistance.

The research carried out under this contract can be divided into three main sections, namely (1) an experimental study of the thick, turbulent boundary-layer near the tail of a body of revolution, (2) methods of calculating the thick, axisymmetric, turbulent boundary-layer and its interaction with the potential flow, and (3) calculation of the

viscous resistance of bodies of revolution at zero incidence. The progress made in each of these areas is reviewed.

AD-780 364/6GA PC$4.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
AEROHYDROELASTICITY THEORY (CHAPTER 9),
V. V. Bolotin, and Yu. N. Novichkov. 23 Apr 74, 76p Rept no. FTD-HC-23-1003-74
Edited trans. of Prochnost i Ustoichivost-Kolebaniya (USSR) v3 p478-512 1968.

Descriptors: *Aeroelasticity, *Hydroelasticity, Elastic properties, Aerodynamic forces, Flutter, Shells(Structural forms), Translations, USSR.

AD-780 366/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EXPERIMENTAL STUDY OF CRITICAL GAS EJECTOR REGIMES UNDER NEGATIVE EJECTION COEFFICIENTS,
A. N. Timoshin. 23 Apr 74, 14p Rept no. FTD-HT-23-679-74
Edited trans. of Lopatochnye Mashiny i Struynye Apparaty. Sbornik Statei (USSR) n6 p211-224 1972, by Marilyn Olaechea.

Descriptors: *Ejectors, Diffusers, Gas flow, Reversing, Supersonic nozzles, Translations, USSR.

AD-780 377/8GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
RESEARCH ON HEAT TRANSFER IN SPHERES AND THIN CONES IN THE HYPERSONIC FLOW OF A RAREFIED GAS,
Yu V. Nikolskii, G. E. Pervushin, and L. G. Chernikova. 19 Apr 74, 14p Rept no. FTD-HT-23-1977-74
Edited trans. of Tsentralnyi Aerogidrodinamicheskii Institut. Uchenye Zapiski (USSR) v1 n1 p71-77 1970, by Ray E. /Zarza.

Descriptors: *Spheres, *Conical bodies, *Hypersonic flow, *Heat transfer, Angle of attack, Wind tunnel models, Translations, USSR.

The research sheds light on heat transfer in spheres and thin cones at a zero angle of attack. The investigations were conducted in a vacuum wind tunnel at Mach numbers M = 4.9-9.5, and Reynold numbers Re0 = 35-1 for spheres, and Re0 = 100-4 for cones; this corresponds to the transition range between free-molecular flow and the flow of a continuous medium. The procedure used was the measurement of the total heat flow under standard conditions with compensation of heat losses in a sting, and an independent measurement of the radiant heat flux. A comparison of the data with the results of the theoretical calculation was made.

AD-780 383/6GA Reprint
New York Univ Bronx Aerospace Lab
LONG TIME BEHAVIOR OF A DECAYING VORTEX,
M. D. Gunzburger. 28 Mar 73, 12p AFOSR-TR-74-0828
Grant AF-AFOSR-1062-67
Revision of report dated 11 Feb 72.
Availability: Pub. in ZAMM, v53 p751-760 1973.

Descriptors: *Vortices, *Two dimensional flow, Navier Stokes equations, Numerical integration.

The motion and decay of a vortex submerged in a two-dimensional inviscid stream is considered with view of seeking solutions valid for all time. A multiple time scale perturbation scheme is used to obtain solutions. The important effects of viscosity near the center of the vortex are included by a systematic procedure. To illustrate the theory solutions are then presented for the motion of a vortex subject to a sudden uniform gust and for the motion of a vortex in the presence of a wall. (Author)

AD-780 449/5GA PC$3.25/MF$1.45
Johns Hopkins Univ Baltimore Md
THE INFLUENCE OF SHEAR ON MIXING ACROSS DENSITY INTERFACES.
Technical rept.,
Robert R. Long. Jun 74, 33p Rept no. TR-4-Ser-C
Contract N00014-67-A-0163-0013

Descriptors: *Air water interactions, *Turbulence, *Shear properties, Buoyancy, Thermoclines, Entrainment, Partial differential equations.
Identifiers: Richardson number.

The paper discussed critically experimental observations of mixing processes across density interfaces in laboratory experiments and inferences that have been made and can be made from these observations. It is shown that the drag coefficient in flow of a stratified fluid over a rough surface is independent of the Richardson number (or density jump across the interface or inversion) and depends only on the ratio of the roughness length to the depth of the homogeneous layer. This has obvious implications for problems of parameterizing the momentum flux near the ground in the atmosphere. (Modified author abstract)

AD-780 483/4GA Reprint
Virginia Polytechnic Inst and State Univ Blacksburg Dept of Aerospace Engineering
A COMPUTERIZED ANALYSIS OF SUPERSONIC NONUNIFORM FLOWS OVER SHARP AND SPHERICALLY BLUNTED CONES AT ANGLE OF ATTACK,
5 R. Black, M. C. Frieders, and Clark H. Lewis. 18 Dec 72, 9p ARL-74-0091
Contract F33615-70-C-1015
Availability: Pub. in Computers and Fluids, v1 p359-365 1973.

Descriptors: *Reentry vehicles, *Supersonic flow, Angle of attack, Blunt bodies, Conical bodies, Flow fields, Skin friction, Heat transfer.
Identifiers: Computer aided analysis.

A system of computer programs has been developed to predict supersonic inviscid and viscous nonuniform flow fields over sharp and spherically blunted cones at angle of attack. For blunt cones the flow fields considered were axisymmetric wake flows positioned such that the flow in the subsonic nose region remained axisymmetric. For sharp cones, both axisymmetric wake flows and two-dimensional shear flows were considered. The programs used in solving inviscid flow fields incorporate a modified inverse method eor solving subsonic flow regions and modified axisymmetric and three-dimensional method of characteristics procedures for and modified axisymmetric and three-dimensional method of characteristic procedures for solving the supersonic flow regions. Body properties predicted by the inviscid solutions were used as edge data for solution of the corresponding laminar boundary layers over the bodies. The viscous flow solutions were obtained using axisymmetric and full three-dimensional boundary-layer programs. (Modified author abstract)

PB-233 066/0GA PC$5.50/MF$1.45
Iowa State Univ., Ames. Heat Transfer Lab.
A BOUNDARY LAYER FINITE DIFFERENCE METHOD FOR CALCULATING THROUGH THE SEPARATION POINT AND INTO THE REGION OF RECIRCULATION IN INCOMPRESSIBLE LAMINAR FLOW.
Technical rept.,
C. L. Dancey, and R. H. Pletcher. Jun 74, 182p
ISU-ERI-AMES-74103, HTL-2
Grant NSG-GK-18810

Descriptors: *Laminar flow, *Incompressible flow, *Finite difference theory, Navier - Stokes equations, Viscous flow, Boundary layer separation, Computer programs, FORTRAN.

A finite difference calculation procedure is presented for computing past the separation point for incompressible laminar boundary layer flows. The method includes an iterative interaction calculation whereby the pressure gradient is altered by the boundary layer growth, resulting in the removal of the separation point singularity and a shift in the predicted separation point downstream (compared with ordinary boundary layer predictions) more in line with recent Navier-Stokes solutions for laminar flows. The use of a reversed flow model permits integration beyond the separation point, into the recirculating flow region, while retaining the marching method of solution. (Modified author abstract)

UCID-30089 PC$12.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
SHEMP: A SERVICE PROGRAM FOR THE HEMP PROGRAM.
J. A. Leibee. 19 Feb 74, 190p
Contract W-7405-eng-48

Descriptors: (*Fluid mechanics, *Two-dimensional calculations), (*Computer codes, *H codes), Cdc computers, Elasticity, Finite difference method, Fortran, Hydrodynamics, Lagrangian function, Lawrence livermore laboratory, Plasticity, S codes.

For abstract, see NSA 29 12, number 31615.

UCRL-51079(Rev.1) PC$7.60/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
HEMP USER'S MANUAL.
E. D. Giroux. 17 Dec 73, 206p
Contract W-7405-Eng-48

Descriptors: (*Fluid mechanics, *Two-dimensional calculations), (*Computer codes, *H codes), Cdc computers, Elasticity, Finite difference method, Fortran, Hydrodynamics, Lagrangian function, Manuals, Plasticity.

For abstract, see NSA 29 12, number 31617.

20E. Masers and Lasers

AD-779 799/6GA PC$4.00/MF$1.45
Bendix Research Labs Southfield Mich
FEASIBILITY STUDY OF EXOELECTRON IMAGING AS AN NDT METHOD FOR LASER SURFACE DAMAGE OF NONLINEAR OPTICAL MATERIALS AND LASER GLASS.
Semi-annual technical rept. no. 2, Mar-Sep 73,
Peter F. Braunlich, and John P. Carrico. Sep 73, 82p Rept no. BRL-7058 AFCRL-TR-73-0591
Contract F19628-73-C-0032, ARPA Order-2042
See also report dated Mar 73, AD-766 244.

Descriptors: *Laser materials, *Radiation effects, Laser beams, Surface properties, Electron emission, Sodium chloride, Lithium fluorides, Dielectrics, Dielectrics, Optical glass, Nondestructive testing.
Identifiers: Exoelectron emission, Lithium niobates.

The semi-annual report presents the results of a second six-month effort on the development of an NDT method to predict laser surface damage on dielectric materials used in high power laser systems. Experimental results on thermally and/or optically stimulated exoelectron emission from Nd-2 laser glass, and NaCl and LiNbO3 single crystals after electron bombardment or exposure to high peak power laser pulses are given. Computer calculations of the spatial variation of the density of trapped electrons after exposure of a pure NaCl single crystal to a high peak power

pulse of a TEM(00) mode laser beam are reported and discussed. Experiments on exoelectron images from LiF surfaces are interpreted on the basis of these results. The role of a white-hot plasma in front of the examined LiF surface is described. New information on multiphoton free carrier generation, on free carrier absorption, and on their involvement in the exoelectron processes and in the surface damage mechanisms was obtained. (Author)

AD-779 838/2GA PC$3.25/MF$1.45
Naval Research Lab Washington D C
TOWARDS SHORTER WAVELENGTH LASERS AND BREAKING THE 1000 A BARRIER I (ELECTRON AND PHOTON PUMPING).
Interim rept.,
A. W. Ali. May 74, 40p* Rept no. NRL-MR-2792

Descriptors: *Ultraviolet lasers, *Excitation, Optical pumping, Electron irradiation, Gain.
Identifiers: *X ray lasers.

In the report electron and proton pumping as excitation mechanisms for vacuum ultraviolet (VUV) and x-ray lasers are discussed. Criteria are developed and quantitative estimates of the required pump powers are given. The necessary tools for model calculations are presented and some possible short wave laser sources are pointed out. (Author)

AD-779 916/6GA PC$3.00/MF$1.45
Catholic Univ of America Washington D C Dept of Chemistry
INFRA-RED LASERS AND INFRA-RED SPECTRA OF FREE RADICALS.
Annual rept.,
F. X. Powell. 23 Apr 74, 23p
Contract N00014-67-A-0377-0010
See also report dated 1973, AD-758 405.

Descriptors: *Gas lasers, *Laser gases, Nitrogen, Excitation, Nitrogen oxides, Carbon dioxide lasers, Chemical lasers, Infrared lasers.

The reaction of NO with active nitrogen produces excited species which can transfer energy to CO2 yielding laser lines at 10.6 micrometers. It has been demonstrated that the reaction of N atoms with NO yields N2 in a vibrationally excited state. It has also been demonstrated that the discharge parameters are critical and that different discharges produce species which can energize the laser in various ways. (Author)

AD-779 917/4GA PC$3.75/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
OPTICS RESEARCH: 1973:2.
Semiannual rept. 1 Jul-31 Dec 73,
Robert H. Rediker. 31 Dec 73, 75p ESD-TR-74-17
Contract F19628-73-C-0002, ARPA Order-600
See also AD-770 629.

Descriptors: *Lasers, *Optical instruments, *Optical radar, Laser beams, Light transmission, Atmosphere models, Thermal blooming, Aerosols, Fog, Carbon dioxide lasers, Gas lasers, Infrared lasers, Interferometers.
Identifiers: Hydrogen fluoride lasers.

The report covers work of the Optics Division at Lincoln Laboratory for the period 1 July through 31 December 1973. The topics covered are laser technology and propagation and optical measurements and instrumentation. (Modified author abstract)

AD-779 940/6GA PC$4.50/MF$1.45
Informatics Inc Rockville Md
BIBLIOGRAPHY OF SOVIET LASER DEVELOPMENTS. NUMBER 14, OCTOBER-DECEMBER 1973,
Stuart G. Hibben. 30 Apr 74, 123p AFOSR-TR-74-0796
Contract F44620-72-C-0053, ARPA Order-1622
See also report dated 23 Jan 74, AD-776 072.

Descriptors: *Lasers, *Bibliographies, *USSR, Gas lasers, Infrared lasers, Solid state lasers, Semiconductor lasers, Liquid lasers, Chemical lasers, Ultraviolet lasers, Dye lasers, Laser materials, Semiconductors, Optical equipment components, Pulse generators, Crystal growth, Radiation effects, Laser hazards, Laser communications, Data processing, Holography, Test equipment, Plasma generators.
Identifiers: Organic dye lasers, Nonlinear optics, Laser radiobiology, Gamma ray lasers.

This is the Soviet Laser Bibliography for the fourth quarter of 1973 and is No. 14 in the series on Soviet laser developments. The coverage includes basic research on solid state, liquid, gas, and chemical lasers; components; nonlinear optics; spectroscopy of laser materials; ultrashort pulse generation; crystal growing; theoretical aspects of advanced lasers; and general laser theory. Laser applications are listed under biological effects; communications; computer technology; holography; laser-induced chemical reactions; instrumentation and measurements; beam-target interaction; and plasma generation and diagnostics. (Author)

AD-780 082/4GA PC$3.25/MF$1.45
Army Electronics Command Fort Monmouth N J
MEASUREMENT OF HO3+:YLF 2.06 MICROMETER LASER SPECTRAL OUTPUT VARIATIONS AND CO2 ABSORPTION COINCIDENCE.
Research and development technical rept.,
K. O. White, W. R. Watkins, and S. A. Schleusener. Apr 74, 30p Rept no. ECOM-5538

Descriptors: *Solid state lasers, *Infrared lasers, Lithium compounds, Fluorides, Yttriates, Doping, Holmium, Laser beams, Bandwidth, Wavelength, Absorption, Carbon dioxide.
Identifiers: *YLF lasers, *Holmium lasers, Lithium tetrafluoroyttriate.

The spectral output of a multiply doped Ho3+:YLF laser in the 2.06 micrometer region was measured using a 5-m grating spectrometer. The average spectral bandwidth of the laser output was found to be 0.5 nm. The laser output varied within a 1.5-nm range about 2.0646 micrometers. (Modified author abstract)

AD-780 103/8GA PC$4.75/MF$1.45
General Dynamics Fort Worth Tex Convair Aerospace Div
ELECTROSTATIC COOLING OF LASER MIRRORS AND WINDOWS.
Final rept. 20 Mar 73-15 Feb 74,
K. G. Kibler, and H. G. Carter, Jr. Apr 74, 143p AFWL-TR-73-298
Contract F29601-73-C-0057

Descriptors: *Laser materials, *Windows, *Mirrors, *Cooling, Electrostatic charge, Heat transfer, Aluminum, Zinc selenides.
Identifiers: *Electrostatic cooling.

Investigations have been conducted to determine the mechanism of electrostatic cooling and to optimize its application for laser mirrors and windows. Electrostatic cooling in air is found to be essentially an ionic drag phenomenon in which the convective heat transfer coefficient is proportional to the fourth root of corona current. Results on samples of ZnSe, aluminum, and CerVit, ranging from 1.5 to 4-in. diameter, indicate that convective cooling by electric probes in air is generally 10 to 15 times the natural convection cooling rate. This cooling rate may be increased by another factor of 2 if a polar gas is used instead of air. A guide for the estimation of electrostatic cooling for a prescribed system is given by a theoretically-formulated approximate equation which relates heat transfer coefficients to corona current, sample size, and gas parameters. Design recommendations for applications to laser mirrors and windows are included, and several optimization techniques are suggested. (Author)

AD-780 176/4GA PC$6.00/MF$1.45
TRW Systems Group Redondo Beach Calif
H2-CL2 CHEMICAL LASER PROGRAM. PART II. ARC JET LASER EXPERIMENT.
Final rept. Dec 72-Dec 73,
R. J. Reiner, G. Emanuel, J. Trost, J. Reeve, and R. A. Ackerman. Jan 74, 229p* RK-CR-74-9-Pt-2
Contract DAAH01-73-C-0446
See also Part 1, AD-780 178.

Descriptors: *Chemical lasers, *Jet mixing flow, Experimental data, Gas flow, Chlorine, Chain reactions, Power, Hydrogen chloride, Experimental design, Engineering drawings, Electric arcs, Reaction kinetics.
Identifiers: *Hydrogen chloride lasers.

The authors describe work done under a program to demonstrate feasibility of a supersonic mixing laser using chain reactions of the H2-Cl2 system to produce vibrationally excited HCl. This report describes the experimental setup, test procedures and hardware operation, and results of tests carried out to date. The experiment uses arc heated diluent gas to partially dissociate chlorine. Diluent plus chlorine gas flows through a two dimensional nozzle bank and then mixes with slit injected H2 as a free jet in a stable laser cavity. Three diluents (N2, He, Ar) have been used in the tests with CW laser power measured using the first two. Peak power of 27 mw was detected using He diluent. Previous theoretical analysis predicted much higher powers. The reasons for the discrepancy are discussed and future experiments are suggested. (Author)

AD-780 238/2GA PC$3.25/MF$1.45
Mathematical Sciences Northwest Inc Seattle Wash
ELECTRON BEAM MOLECULAR LASERS.
Semi-annual technical rept. no. 2, 15 Nov 72-15 May 73,
S. R. Byron, L. Y. Nelson, C. H. Fisher, G. J. Mullaney, and A. L. Pindroh. Aug 73, 50p Rept no. MSNW-74-105-2
See also report dated Nov 72, AD-763 409.

Descriptors: *Gas lasers, *Chemical lasers, *Electric discharges, Excitation, Electron irradiation, Electron guns, Hydrogen compounds, Deuterium compounds, Fluorides, Infrared lasers, Nitrogen.
Identifiers: Hydrogen fluoride lasers, Deuterium fluoride lasers, Nitrogen lasers.

The program is directed toward developing efficient, high energy density electric discharge lasers in the infrared and visible regions of the spectrum. A high current, electron-beam-stabilized, electric discharge is used for excitation. Infrared laser emission and absorption from the vibrational levels of HF (2.8 to 3.1 micrometers) and DF (3.8 to 4.1 micrometers) in various gas mixtures is being studied to determined laser efficiency and to obtain a detailed model of the vibrational kinetics. The efficiency of electric discharge excitation of molecular vibration in these gases is being determine by solving the electron Boltzmann equation. Electronic state excitation by e-beam stabilized electric discharges in N2 and other molecular systems is being investigated in an effort to develop efficient, long pulse visible lasers. (Author)

AD-780 265/5GA PC$5.25/MF$1.45
Northrop Research and Technology Center Hawthorne Calif
HIGH POWER CO LASER.
Semiannual technical rept. 1 Sep 73-28 Feb 74,
G. L. McAllister, W. B. Lacina, D. K. Rice, and P. J. Mendoza. May 74, 42p Rept no. NRTC-74-21R
Contract N00014-72-C-0043, ARPA Order-1806

Descriptors: *Carbon monoxide lasers, *Gas lasers, High power, Excitation, Electron irradiation, Gain, Efficiency.
Identifiers: Design.

Effort on the High Power CO Laser Program is reviewed. The program is directed toward the development of the required CO laser technology, the required component technology, and the design and construction of intermediate power laser devices. The results of analytical and experimental investigation of the basic characteristics of the laser and data from a high pressure electrically excited CO laser device are discussed. (Author)

AD-780 266/3GA PC$3.25/MF$1.45
Lockheed Missiles and Space Co Inc Palo Alto Calif Palo Alto Research Lab
HIGH-EFFICIENCY, SINGLE-FREQUENCY LASER AND MODULATION STUDY.
Semiannual technical rept. no. 3,
Robert C. Ohlmann, K. K. Chow, J. J. Younger, W. B. Leonard, and D. G. Peterson. 30 Sep 73, 45p Rept no. LMSC-D401776
Contract N00014-71-C-0049, ARPA Order-306
See also report dated 30 Nov 72, AD-755 219.

Descriptors: *Optical communications, *Laser modulators, *Infrared lasers, Neodymium lasers, Frequency shift keyers, Frequency modulators.
Identifiers: *YAG lasers, Optical modulators.

The work described in the report is the final year's effort of a three-year program to study wide bandwidth laser communications at 0.16-micrometer wavelengths. Earlier efforts of this program (during the first two years) were directed to studying the means to produce a high-efficiency, single-frequency neodymium doped yttrium aluminum garnet (Nd:YAG) laser operating at 1.06 micrometer, and to produce high-efficiency, octave-bandwidth, microwave light modulators for this wavelength. In addition, a study was also made of laser communication configurations that were suitable for very high data rates. The overall objective of this year's program, then, is to apply the results of these earlier studies to assemble a laboratory communication system that uses the entire modulation bandwidth available. In particular, the final result of this program is to be a laboratory demonstration of a laser-communication system having a bandwidth of 2 GHz.

AD-780 274/7GA PC$3.25/MF$1.45
Avco Everett Research Lab Inc Everett Mass
CARBON MONOXIDE LASER.
Annual technical rept.,
Robert E. Center. May 74, 48p
Contract N00014-72-C-0030, ARPA Order-1807
See also report dated Apr 73, AD-759 755.

Descriptors: *Carbon monoxide lasers, *Gas lasers, *Infrared lasers, High power, Excitation, Electron irradiation, Electric discharges, Reaction kinetics, Efficiency, Performance(Engineering).
Identifiers: Performance evaluation.

The main objective is the investigation of the pulsed electrical CO laser to determine the relevant scaling parameters and the usefulness of high power CO lasers in systems applications. The current contract has included parametric multiline/multimode performance measurements, investigation of the medium homogeneity using interferometric diagnostics, calculations of CO lineshift and linewidth as a function of pressure in CO-N2 mixtures and detailed parametric performance calculations for both single and multiline operation. The parametric performance calculations are described in an appendix to the present report and should prove to be useful for systems design considerations. The calculations have been made for single and multiline outputs as well as selected multiline output. Also included in this report are some detailed lineshift calculations in CO-N2 mixtures. The shifts are predicted to be less than 0.005/cm per atmosphere N2. (Modified author abstract)

AD-780 331/5GA Not available NTIS
National Research Council of Canada Ottawa (Ontario) Div of Physics
ABSOLUTE FREQUENCY MEASUREMENTS OF 12C16O AND 13C16O LASER TRANSITIONS,
B. G. Whitford, K. J. Siemsen, and H. D. Riccius. 18 Jan 74, 3p NRC-13870
Availability: Pub. in Optics Communications, v10 n3 p288-289 Mar 74.

Descriptors: *Carbon monoxide lasers, *Spectral lines, Canada, Spectrum analysis, Infrared radiation, Molecular energy levels, Frequency, Wavelengths.

The absolute frequencies of one 5.2 micrometer (12C)(16O) laser line and one 5.3 micrometer (13C)(16O) laser line have been measured against micrometer band transitions of the CO2 laser by heterodyning in a tungsten-nickel diode. The frequencies, wavelengths and wave numbers of these lines are reported to an accuracy of one part in ten million. (Author) wavelengths and wave numbers of these lines are reported to an accuracy of one part in ten million. (Author)

AD-780 421/4GA PC$3.00/MF$1.45
Naval Training Equipment Center Orlando Fla
OPTICAL EFFECT OF A SPHERICAL END PLATE ON A LASER BEAM.
Technical rept.,
George Derderian. May 74, 6p Rept no. NAVTRAEQUIPC-IH-236

Descriptors: *Laser cavities, *Light transmission, Laser beams, Optical equipment components, Collimators.

A mathematical analysis is presented of the deterioratong effect of a spherical end plate on a collimated laser beam.

AD-780 480/0GA Reprint
Stanford Univ Calif Microwave Lab
ACTIVE MODE-COUPLING PHENOMENA IN PULSED AND CONTINUOUS LASERS.
Interim rept.,
A. E. Siegman, and D. J. Kuizenga. 15 Oct 73, 27p Rept no. ML-2228 AFOSR-TR-74-0880
Contract F44620-71-C-0053
Sponsored in part by National Aeronautics and Space Administration.
Availability: Pub. in Jnl. of Opto-electronics, v6 p43-66 1974.

Descriptors: *Mode locked lasers, *Neodymium lasers, *Carbon dioxide lasers, Laser cavities, Optical equipment components, Modulators, Acoustooptics, Electrooptics, Amplitude modulation, Frequency modulation.
Identifiers: YAG lasers, Optical modulators, Electrooptic modulators, Acoustooptic modulators.

An optical modulator inside a laser cavity, if driven at the cavity c/2L frequency or a harmonic, will produce a variety of mode-coupled short-pulse and FM-laser phenomena. The paper reviews the kinds of CW and transient mode-coupling phenomena hat can occur in CW lasers and in selected lower-power pulsed lasers using either an active optical modulator or in some cases passive saturable absorbers. (Author)

AD-780 504/7GA PC$7.00/MF$1.45
University of Southern California Los Angeles Electronic Sciences Lab
IR WINDOW STUDIES.
Quarterly technical rept. no. 5,
Ferdinand A. Kroger, and John H. Marburger. 15 Sep 73, 77p Rept no. USCEE-457 AFCRL-TR-73-0680
Contract F19628-72-C-0275, ARPA Order-2055
See also AD-770 009.

Descriptors: *Infrared windows, *Infrared optical materials, *Infrared lasers, Semiconducting films, Epitaxial growth, Gallium arsenides, Potassium compounds, Chlorides, Bromides, Cadmium tellurides, Defects(Materials), Thermal stresses, Absorption, Optical properties.
Identifiers: Potassium chloride, Potassium bromide, Thermal lens effect.

The temperature dependence of the 10 micrometer absorption of GaAs in air shows contributions by free carriers above 250C, and surface effects due to oxidation. The dielectric constant of GaAs is found to be 12.4 plus or minus 0.12. An accurate method to determine the oxygen content of GaAs has been developed. Results obtained so far given 10 to the 17 power - 10 to the 18th power/cc or 6 x 10 to the 14th power O atoms per sqcm surface. Conditions favorable to the growth of thick layer GaAs have been established. Pure KCl has K approximately = 10 to the minus 4th power/cm. KBr has been purified and crystals have been grown. Analysis of the defect structure of CdTe was completed. Experimental conditions leading to high resistivity, stoichiometric material were established. Hot pressing of CdTe was started. The fundamental processes underlying multiphonon absoroption were investigated. A caustic surface analysis for thermal lensing was made, and the stress and the stress fields in non-uniformly stresses windows were determined. (Modified author abstract)

COM-74-11056/0GA PC$20.00/MF$20.00
National Technical Information Service, Springfield, Va.
CARBON DIOXIDE LASERS. A BIBLIOGRAPHY WITH ABSTRACTS.
Rept. for 1964-May 74,
Douglas M. Craig. Jun 74, 175* NTIS-WIN-74-046

Descriptors: *Carbon dioxide lasers, *Bibliographies, Chemical lasers, Gas lasers, Infrared lasers, Gas dynamics, Energy transfer, Excitation, Optical pumping, Optical equipment components, Infrared windows, Infrared materials, Chemical reactions, Supersonic nozzles, Nozzle gas flaw, Light pulses, Performance evaluation, Design.
Identifiers: Gas dynamic lasers, Waveguide lasers, Tunable lasers.

The bibliography contains 170 selected abstracts of research reports retrieved using the NTIS online search system-NTISearch. The design, construction, operation, and performance of CO2 lasers are included. Other topics include excitation, optical pumping, light pulses, infrared windows and optical materials, mirrors, frequency tuning and modulation, chemical reactions, and gas dynamics. Foreign Translations and reports not available through NTIS are excluded.

PATENT-3 769 608 Not available NTIS
Department of the Air Force Washington D C
ULTRA HIGH FREQUENCY MECHANICAL Q-SWITCH.
Patent,
Leslie O. Vargady. Filed 17 May 72, patented 30 Oct 73, 6p Rept nos. PAT-APPL-254 143,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Lasers, *Q switching, *Patents, Mechanical components, Ultrahigh frequency, Switches.
Identifiers: PAT-CL-331-94-5-Q, Q switched lasers.

The patent describes a laser which achieves a high repetition rate by using a central rotating reflector and a single spherical reflector. If the intersection of the axis of rotation and surface of the central reflector is exactly on the center of the spherical reflector, a beam entering on the axis of rotation and focused on the spherical reflector will be constantly retro-reflected while the central reflector rotates about its rotational axis.

PATENT-3 787 781 Not available NTIS
Department of the Air Force Washington D C
EXTERNAL CATHODE/INTERNAL ANODE FIGURE EIGHT LASER.
Patent,
Gustav K. Medicus, and Onezime P. Breaux. Filed 7 Aug 72, patented 22 Jan 74, 8p Rept nos. PAT-APPL-278 330,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Gas lasers, *Patents, Discharge tubes, Cold cathode tubes.
Identifiers: PAT-CL-331-94-5-D, Helium neon lasers.

The patent describes a transverse-discharge slotted hollow cathode gaseous laser having an external cathode with the anode contained within the confines of the cathode provides an easily cooled, stabilized (non-thermionic-emitting) cold-cathode, rugged, 'all metal' laser.

20F. Optics

AD-779 847/3GA PC$3.75/MF$1.45
Naval Electronics Lab Center San Diego Calif
DESIGN OF OPTICAL CIRCUITS.
Research and development rept. Jul 72-Jan 74,
H. F. Taylor. 2 Apr 74, 70p* Rept no. NELC-TR-1913

Descriptors: *Integrated circuits, *Optical equipment, *Electrooptics, Thin films, Waveguides, Light transmission, Maxwells equations, Wave equations, Fiber optics transmission lines, Transmission loss.
Identifiers: *Optical waveguides, *Integrated optical circuits.

The report discusses new concepts in the areas of waveguide interconnection losses, switches and switching networks, and frequency-selective and broadband directional couplers derived from a theoretical analysis of propagation in optical waveguide components. It lists the functions which IOCs are expected to perform and suggests specific configurations for avionics information transfer and processing systems using IOC components. (Author)

AD-779 945/5GA PC$12.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
ATMOSPHERIC TRANSMISSION OF 1.06 MICRON LASER RADIATION: APPLICATION TO STANDOFF MISSILE PERFORMANCE.
Master's thesis,
Charles H. Coolidge, Jr. Mar 74, 183p Rept no. GEP/PH/74-4

Descriptors: *Laser beams, *Target designators, Infrared detection, Attenuation, Mie scattering, Absorption, Aerosols, Clouds, Rain, Fog, Theses.
Identifiers: *Atmospheric attenuation.

A model for the prediction of maximum target lock-on range for a 1.06 micron laser target designator weapon system where atmospheric attenuation of the laser radiation is the limiting system factor is derived. The laser range equation is based on the assumption of specific designator/receiver design characteristics, the assumption that the target is a Lambert surface, and the assumption of the validity of the Beer-Lambert Law for describing atmospheric propagation of laser radiation. (Author)

AD-780 398/4GA Reprint
Washington Univ St Louis Mo Dept of Physics
DISTORTIONLESS PROPAGATION OF ZERO-DEGREE PULSES IN DEGENERATE RESONANT MEDIUM.
Interim rept.,
E. Y. C. Lu, and L. E. Wood. 29 Nov 73, 5p
AFOSR-TR-74-0837
Contract F44620-69-C-0121
Availability: Pub. in Applied Physics Letters, v24 n8 p382-384, 15 Apr 74.

Descriptors: *Light pulses, Wave propagation, Resonance, Atomic energy levels, Maxwells equation, Velocity.

The authors give arguments to show that distortionless propagation of zero-degree pulses is possible in an arbitrary degenerate resonant medium in agreement with recent experimental observation. In the case of overlapping Q(2) degeneracy, the analytic closed-form solution with zero area is given. The predicted pulse shape depends in the relative occupation of the degenerate levels and should be observable experimentally. (Author)

AD-780 399/2GA Reprint
Washington Univ St Louis Mo Dept of Physics
ANALYTIC DESCRIPTION OF DISTORTIONLESS PROPAGATION IN A RESONANT ABSORBING MEDIUM WITH OVERLAPPING Q(J) TRANSITIONS.
Interim rept.,
E. Y. C. Lu, and L. E. Wood. 17 Oct 73, 6p
AFOSR-TR-74-0838
Contract F44620-69-C-0121
Revision of report dated 15 Aug 73.
Availability: Pub. in Optics Communications, v10 n2 p169-171 Feb 74.

Descriptors: *Light pulses, Absorption(Physical), Atomic energy levels, Transitions, Transparence.

Analytic closed form solutions are obtained for distortionless propagation of ultra-short optical pulses through a resonant medium with overlapping Q(j) transitions for j = 2. Apart from the expected 2 pi solutions, the authors also found 0 pi solutions in contrast to conclusions based on numerical calculations. (Modified author abstract)

AD-780 419/8GA PC$3.00/MF$1.45
Naval Training Equipment Center Orlando Fla
PIEZOELECTRIC LASER BEAM DEFLECTOR.
Technical rept.,
George Dederian. Apr 74, 17p Rept no. NAVTRAEQUIPC-IH-233

Descriptors: *Laser beams, *Deflectors, Piezoelectric crystals, Piezoelectric transducers.

There has been considerable activity in an attempt to develop a practical laser deflector. The report discusses the feasibility of using a piezoelectric torsional deflector for this purpose. An introduction to piezoelectricity is given. The longitudinal, bending, and torsional modes of piezoelectric crystals are discussed using pertinent equations and figures. (Author)

AD-780 506/2GA PC$3.75/MF$1.45
Rome Air Development Center Griffiss AFB N Y
FOUNDATIONS OF DIFFRACTION THEORY.
Technical rept. Jan 72-Mar 73,
Andrew R. Pirich. Jun 74, 58p Rept no. RADC-TR-74-166

Descriptors: *Diffraction, Theory, Apertures, Light scattering, Acoustic scattering, Electromagnetic scattering, Vector analysis.
Identifiers: Scalars, Fresnel diffraction, Fraunhofer diffraction.

The intent of this report is to synopsize the Scaler and Vector Diffraction Phenomena that characterize the electromagnetic effects of the Fresnel (nearfield) and Fraunhofer (far-field) Diffraction. Included in this report are the author's views concerning electromagnetic phenomena at the aperture by employing Babinet's Principle. (Modified author abstract)

COM-74-50536/3GA PC-GPO/MF$1.45-NTIS
National Bureau of Standards, Washington, D.C. Heat Div.
OPTICAL RADIATION MEASUREMENTS: TABLES OF DIFFRACTION LOSSES.
Final rept.,
W. B. Fussell. Jun 74, 40p NBS-TN-594-8
Library of Congress Catalog Card no. 74-600088.
See also rept. no. NBS-TN-594-7, COM-74-50238.
Paper copy available from GPO $0.75 as C13.46:594-8.

Descriptors: *Diffraction, Ultraviolet radiation, Light(Visible radiation), Infrared radiation, Transmission loss, Tables(Data), Radiometry, Photometry.

Tables of diffraction losses are given for a range of typical experimental geometries for wavelengths from 0.2 to 100 micrometers. The scaling relationships for the diffraction losses for varying wavelengths and geometries are also given, and sample calculations are presented. General formulas are given for the diffraction losses; the formulas are derived from the Kirchhoff scalar paraxial diffraction theory. The accuracy of the tabulated values is estimated.

PAT-APPL-453 PC$4.25/MF$1.45
Department of Health, Education, and Welfare, Washington, D.C.
SPHERICALLY CORRECTED REFLECTING OBJECTIVE FOR UNIT MAGNIFICATION.
Patent Application,
Klaus D. Telenz. Filed 20 Mar 74, 22p DHEW-E-95-73
Government-owned invention available for licensing. Copy of application available NTIS.

Descriptors: *Optical equipment components, *Reflectors, *Patent applications, Spectrometers, Magnification.

The patent application describes a spherically corrected reflecting objective for unit magnification of the Cassegrainian-type consisting of two mirrors with oppositely equal curvatures. The objective is particularly useful in a fast spectrometer system. (Modified author abstract)

PATENT-3 781 094 Not available NTIS
Department of the Air Force Washington D C
LIQUID COOLED MIRROR STRUCTURE.
Patent,
Raymond H. Griest. Filed 15 Sep 72, patented 25 Dec 73, 6p Rept nos. PAT-APPL-289 692,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Mirrors, *Liquid cooling, *Patents, Lasers, Optical equipment.
Identifiers: PAT-CL-350-310.

The patent describes a liquid cooled mirror structure having a body, inner plate and face sheet. The body has longitudinal channels therein, the inner plate has narrow channels therein perpendicular to the longitudinal channels and the face sheet has a dense pattern of grooves therein perpendicular to the narrow channels. In operation coolant flows horizontally through the longitudinal channels, vertically through the narrow channels and horizontally through the grooves thereby cooling the face sheet by providing a high intrinsic impedance to the coolant flow, and high specific heat transfer coefficient, with a minimum of pressure drop.

20G. Particle Accelerators

AD-780 395/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
COLLECTIVE CYCLIC ACCELERATOR - A GYROTRON,
A. A. Kolomenskii. 24 May 74, 9p Rept no. FTD-HT-23-1327-74
Edited trans. of Simpozium po Kollektivnym Metodam Uskoreniya, Dubna, 27-30 Sep 72 p115-118, by Charles T. Ostertag, Jr.

Descriptors: *Electron accelerators, Translations, USSR.

AECL-4512 PC$5.25/MF$1.45
Atomic Energy of Canada LTD., Chalk River, Ontario. Chalk River Nuclear Labs.
UPGRADING OF THE CRNL MP TANDEM FOR 13 MV OPERATION.
N. Burn, A. B. McDonald, H. R. Andrews, J. C. D. Milton, and L. B. Bender. Dec 73, 45p

Descriptors: (*Van de graaff accelerators, *Performance), Beam injection, Beam strippers, Electrodes, Hv systems, Ion sources, Operation, Performance testing.

For abstract, see NSA 29 12, number 30213.

AERE-R-7672 PC$4.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
NEGATIVE ION SOURCES OF THE HARWELL TANDEM GENERATOR.
P. Humphries. Feb 74, 11p

Descriptors: (*Ion sources, *Design), (*Van de graaff accelerators, Ion sources), Aere, Anions.

For abstract, see NSA 29 12, number 30239.

CEA-R-4546 PC$9.75/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France).
STUDY OF THE ADAPTATION OF AN EXTERNAL HEAVY ION SOURCE WITH THE GRENOBLE ISOCHRONOUS CYCLOTRON.
G. A. Rallu. Feb 74, 132p
In French.

Descriptors: (*Grenoble cyclotron, *Beam injection), Beam emittance, Heavy ions, Penning ion sources.

For abstract, see NSA 29 12, number 30240.

DESY-73-63 PC$4.25/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
PROTOTYPE POLARIZED ELECTRON SOURCE THROUGH ELECTRON--HYDROGEN SPIN-EXCHANGE WITH TEFLON CONTAINMENT OF HYDROGEN AND A LONGITUDINAL MAGNETIC TRAP.
R. Krisciokaitis, and W. K. Peterson. Dec 73, 23p

Descriptors: (*Electron sources, *Performance), (*Linear accelerators, Electron sources), Design, Electron-atom collisions, Hydrogen, Polarization, Polarized beams, Teflon.

For abstract, see NSA 29 12, number 30241.

FRNC-TH-454 PC$8.50/MF$1.45
Paris-11 Univ., 91 - Orsay (France).
FREQUENCY MULTIPLYING ELECTRON COLLISION RING.
J. F. Gournay. 1972, 107p
In French.

Descriptors: (*Storage rings, Synchrotron radiation), (*Synchrotron radiation, *Accelerator facilities), (*Light sources, Synchrotron radiation), Calibration standards, Electrons, Frequency converters, Infrared radiation, Microwave radiation, Performance.

For abstract, see NSA 29 12, number 30248.

JINR-P13-7657 PC$4.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
BEMS-2 ON-LINE ISOTOPE SEPARATOR AT THE JINR HEAVY ION CYCLOTRON.
V. A. Karnaukhov, A. V. Dem'yanov, D. D. Bogdanov, G. I. Koval, and L. A. Petrov. 1974, 24p
In Russian.

Descriptors: (*Jinr cyclotrons, *Accelerator facilities), (*Isotope separation, Accelerator facilities), (*Cesium isotopes, Isotope separation), (*Barium isotopes, Isotope separation), Heavy ions, On-line systems, Operation, Performance, Reaction product transport systems, Recoils.

For abstract, see NSA 29 12, number 30253.

JINR-P9-7700 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
IMPEDANCE MEASUREMENT AND STUDY OF RESONANCE PROPERTIES OF COMPRESSOR CHAMBER.
L. S. Barabash, S. N. Dolya, and V. A. Petrov. 1974, 20p
In Russian.

Descriptors: (*Collective accelerators, *Magnetic compression), Heavy ions, Impedance, Measuring methods, Resonance.

For abstract, see NSA 29 12, number 30230.

JINR-P9-7778 PC$4.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr).
MEASUREMENT OF PULSE MAGNETIC FIELD DISTORTIONS AND ENERGY LOSS IN COMPRESSOR CHAMBER.
V. S. Aleksandrov, L. S. Barabash, S. M. Biiskii, A. M. Diveev, and Yu. A. Karzhavin. 1974, 28p
In Russian.

Descriptors: (*Collective accelerators, *Magnetic compression), Cylinders, Energy losses, Magnetic fields.

For abstract, see NSA 29 12, number 30231.

KFK-1907 PC$7.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Experimentelle Kernphysik.
SUPERCONDUCTING HELIX SECTION FOR THE ACCELERATION OF PROTONS.
J. Fricke. Jan 74, 81p
In German.

Descriptors: (*Helical waveguides, *Superconductors), (*Linear accelerators, Helical waveguides), Cavity resonators, Deformation, Mev range 01-10, Mev range 10-100, Performance, Protons, Radiation pressure.

For abstract, see NSA 29 12, number 30232.

LA-5529-MS PC$4.00/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
TIME-OF-FLIGHT MEASUREMENTS AT THE LAMPF LOW-ENERGY PION CHANNEL.
M. D. Cooper. Mar 74, 6p
Contract W-7405-eng-36

Descriptors: (*Lampf linac, *Accelerator facilities), (*Pion beams, Particle identification), (*Particle identification, *Time-of-flight method), Electron beams, Linear momentum, Mev range 100-1000, Muon beams, Plastic scintillation detectors, Secondary beams, Targets.

For abstract, see NSA 29 12, number 30254.

LNF-73-36 PC$4.25/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
ENERGY LOSS SPECTROMETER FOR LOW ENERGY PION SCATTERING.
R. Barbini, S. Faini, C. Guaraldo, C. Schaerf, and R. Scrimaglio. Nov 73, 23p

Descriptors: (*Magnetic analyzers, *Performance), (*Frascati synchrotron, Magnetic analyzers), (*Pion beams, Magnetic analyzers), Linear momentum, Magnetic spectrometers, Pions minus, Pions plus, Resolution.

For abstract, see NSA 29 12, number 30255.

LNF-73-38 PC$4.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
DESIGN OF A SOFT X-RAY GRAZING INCIDENCE MONOCHROMATOR FOR SYNCHROTRON RADIATION.
M. Piacentini, and G. Strinati. 27 Jun 73, 19p

Descriptors: (*Synchrotron radiation, Monochromators), (*X radiation, Monochromators), (*Monochromators, *Design), Efficiency, Operation, Performance, X-ray diffraction.

For abstract, see NSA 29 12, number 30256.

LNF-73-59 PC$4.75/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
MEA-MAGNETIC FIELD MEASUREMENTS.
H. Ogren, A. Mariani, and D. Bisello. 8 Oct 73, 34p

Descriptors: (*Adone, Magnetic spectrometers), (*Magnetic spectrometers, *Magnetic fields), Data, Solenoids.

For abstract, see NSA 29 12, number 30257.

RL-74-15 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
EPIC TRANSFER LINES.
B. D. Jones. Jan 74, 12p

Descriptors: (*Storage rings, *Beam transport), Beam dynamics, Beam injection, Beam optics, Colliding beams, Cost, Diagrams, Electron beams, Nina, Particle boosters, Positron beams, Proton beams, Specifications.

For abstract, see NSA 29 12, number 30249.

RL-74-23 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
SWITCHING MAGNET PROFILE AND DIMENSIONS.
A. G. A. M. Armstrong. Feb 74, 4p

Descriptors: (*Nimrod, *Beam extraction), Beam bending magnets, Diagrams, Dimensions, Specifications, T codes.

For abstract, see NSA 29 12, number 30242.

RL-74-28 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
NIMROD OPERATION AND DEVELOPMENT QUARTERLY REPORT OCTOBER 1 TO DECEMBER 31, 1973.
D. E. Gray. Feb 74, 20p

Descriptors: (*Nimrod, *Operation), Cryogenic bubble chambers, High energy physics, Research programs, Rf systems.

For abstract, see NSA 29 12, number 30214.

RL-74-33 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
K17: A SEPARATED LOW MOMENTUM KAON BEAM AT NIMROD. AN INTERIM REPORT.
C. J. Batty, M. K. Craddock, C. J. Reason, R. A. J. Riddle, and R. E. Welsh. Feb 74, 12p

Descriptors: (*Nimrod, *Accelerator facilities), (*Kaon beams, *Beam production).

For abstract, see NSA 29 12, number 30258.

UH-511-145-73 PC$4.00/MF$1.45
Hawaii Univ., Honolulu (Usa). Dept. Of Physics and Astronomy.
NEUTRON BEAM MONITOR FOR NAL EXPERIMENT 87.
D. Yount. Feb 73, 14p
Contract AT(04-3)-511

Descriptors: (*NaI synchrotron, *Beam monitoring), (*Beam monitors, Shower counters), (*Neutron beams, Beam monitoring), (*Shower counters, *Operation), Iron, Scintillation counters.

For abstract, see NSA 29 12, number 30259.

UH-511-163-73 PC$3.00/MF$1.45
Hawaii Univ., Honolulu (Usa).
HYBRID BUBBLE-CHAMBER DETECTION OF NEUTRINO EVENTS: THE EXTERNAL MUON IDENTIFIER.
V. Z. Peterson. 1973, 3p
Contract AT(04-3)-511

Descriptors: (*NaI synchrotron, *Accelerator facilities), (*Muon detection, Bubble chambers), (*Bubble chambers, *Planning), Multiwire proportional chambers.

For abstract, see NSA 29 12, number 30260.

UH-511-165-73 PC$3.00/MF$1.45
Hawaii Univ., Honolulu (Usa). Dept. Of Physics and Astronomy.
NAL 30 M EXP 3 BUBBLE CHAMBER EXTERNAL MUON IDENTIFIER.
F. A. Harris. Oct 73, 12p CONF-730856-1
Contract AT(04-3)-511

Descriptors: (*NaI synchrotron, *Accelerator facilities), (*Muon detection, Bubble chambers), (*Bubble chambers, *Planning), Multiwire proportional chambers.

For abstract, see NSA 29 12, number 30261.

20H. Particle Physics

AD-779 941/4GA PC$6.50/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
THE EFFECT OF AN AIR/GROUND INTERFACE ON FLUENCE FROM A PLANE SOURCE OF NEUTRONS IN HOMOGENEOUS AIR.
Master's thesis,
Frank N. Fredrickson. Mar 74, 69p Rept no. GNE/PH/74-5

Descriptors: *Neutron flux, *Nuclear weapons, *Weapons effects, Air, Diffusion, Neutron cross sections, Computer programs, Survival(General), Theses.

A numerical approximation of the multigroup diffusion equation was used to evaluate fluence from a plane source of neutrons in a homogeneous air environment with an air/ground interface. Data from the air/ground model were compared with data from an infinite homogeneous air model to determine the effect of the air/ground interface on the total neutron fluence in the air. This simple model indicates that the ground acts as a neutron sink for all 22 neutron energy groups studied. Based on this result, a set of modifications to the AFIT Nuclear Survivability Code was recommended to extend the useful range of that code below seven km. (Author)

AD-779 942/2GA PC$10.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
BARNYARD III: A MOMENTS CODE FOR NEUTRON CROSS SECTION COLLAPSING WITH THE CDC 6600 COMPUTER.
Master's thesis,
Richard C. Husemann. Mar 74, 142p Rept no. GNE/PH/74-6

Descriptors: *Neutron cross sections, *Nuclear weapons, *Weapons effects, *Computer programs, Neutron flux, Computer programming, Tables(Data), Theses, FORTRAN.
Identifiers: Barnyard 3 computer program, CDC 6600 computers.

Barnyard 3, a multigroup neutron cross section computer code, was developed to satisfy a need in the Air Force Institute of Technology Graduate Nuclear Effects program for neutron cross sections for nuclear weapons problems. A 99 fine group energy structure covering the energy spectrum from 14.918 Mev to .4139 ev can be collapsed to 22 or fewer broad groups. The absorption, fission, removal, transport and total cross sections are calculated for each broad group as are the average cosine of the scattering angle and group to group scatter transfer cross sections. The zero moment calculated by the code or a user provided flux is used to flux weight these cross sections. (Modified author abstract)

AD-779 944/8GA PC$6.50/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
COMPTON SCATTERING BY K-SHELL ELECTRONS OF HEAVY ELEMENTS.
Master's thesis,
Harry J. Durham. Mar 74, 70p Rept no. GNE/PH/74-4

Descriptors: *Compton scattering, *Differential cross sections, *Nuclear weapons, *Weapons effects, Gold, X rays, electron scattering, Coincidence counting, Theses.

A method for measuring the doubly-differential cross section for Compton scattering is presented. The general shape of the doubly-differential cross-section distribution for 662-keV photons incident on gold is determined for a scatter angle of 90. The distribution exhibits a scattered peak which is wider than predicted by the Compton formula. The energy of the center of the peak is 25 keV higher than predicted for photons Compton scattered by free electrons, indicating a positive Compton defect. A large increase in the relative magnitude of the cross-section distribution is observed at low scattered photon energies. (Author)

AD-780 387/7GA Reprint
Colorado Univ Boulder Dept of Physics and Astrophysics
THEORY OF THE ELECTROMAGNETIC STRUCTURE FUNCTIONS OF THE PROTON.
Interim rept.,
A. O. Barut, and A. Baiquini. 31 Aug 73, 10p AFOSR-TR-74-0874
Grant AF-AFOSR-2289-72
Availability: Pub. in Physical Review D, v9 n4 p1084-1091, 15 Feb 74.

Descriptors: *Protons, *Nuclear structure, Quantum theory, Wave functions.

The knowledge of the wave function of a relativistic composite system constitutes a complete description of its intrinsic properties such as mass spectrum, elastic and inelastic form factors, and structure functions. The wave functions of the proton obtained from the O(4,2) infinite-multiplet model, which were used previously to calculate mass spectra and form factors, are applied to reevaluate in a more complete manner the structure functions in closed form. The resultant scaling functions obey the Drell-Yan relation and, under certain conditions, the Callan-Cross relation. (Modified author abstract)

AD-780 388/5GA Reprint
Colorado Univ Boulder Dept of Physics and Astrophysics
CLASSICAL RELATIVISTIC SCATTERING OF TWO DYONS.
Interim rept.,
A. O. Barut, and H. Beker. 21 Jan 74, 17p AFOSR-TR-74-0875
Grant AF-AFOSR-2289-72
Availability: Pub. in Il Nuovo Cimento, v19A n2 p309-323, 21 Jan 74.

Descriptors: *Elementary particles, Relativity theory, Scattering, Particle trajectories.
Identifiers: *Dyons.

The authors report a remarkable phenomenon in the relativistic classical scattering of two particles having both electric and magnetic charges, which is not present in the ordinary scattering of two singly charged particles, i.e. the occurrence of infinitely many singularities in the differential cross-section. These singularities correspond to compound states formed by the scattered particle making n loops, n = 0, 1, 2, 3,..., around the scattering center; their positions are given for the particular case studies. (Modified author abstract)

AD-780 391/9GA Reprint
Colorado Univ Boulder Dept of Physics and Astrophysics
THEORY OF NUCLEON-NUCLEON SCATTERING.
Interim rept.,
A. O. Barut, S. A. Baran, and B. C. Unal. 1973, 45p AFOSR-TR-74-0878
Grant AF-AFOSR-2289-72
Availability: Pub. in Fortschritte der Physik, v21 n11 p609-651 1973.

Descriptors: *Nucleons, *Nuclear scattering, Regge poles, Relativity theory, Lorentz force, Matrices(Mathematics), Deuterons.
Identifiers: *Strong interactions, Spinors.

The authors present a new study of kinematical problems of relativistic nucleon-nucleon interactions, more complete than the previous studies. Two-component spinor formalism is used throughout. Several choices of spinor bases, their relations, crossing relations in all channels, helicity amplitudes, partial-wave amplitudes, the absence of kinematical singularities, and unitarity are discussed. The contributions of arbitrary intermediate states J in the unitarity are summed and the Regge forms for all five scalar amplitudes are obtained. (Author)

AD-780 392/7GA Reprint
Colorado Univ Boulder Dept of Physics and Astrophysics
FORM FACTORS AND FOURTH ORDER DIVERGENCE CANCELLATIONS IN THE GAUGE THEORY OF WEAK INTERACTIONS,
S. A. Baran. 27 Jun 73, 19p AFOSR-TR-74-0879
Grant AF-AFOSR-2289-72
Revision of report dated 14 May 73.
Availability: Pub. in Nuclear Physics, vB62 p333-349 1973.

Descriptors: *Nuclear structure, Elementary particles, Nuclear scattering, Dispersion relations.
Identifiers: *Weak interactions, Form factors, Gauge conditions.

The author discusses in detail, by dispersion-theoretic techniques, the contribution of W particles to the form factors of leptons in the gauge theory of weak interactions. It is shown that the form factors are highly divergent in the U-gauge. By calculating fourth order diagrams with W(-)W(+) and (Z sub phi) intermediate states for lepton-lepton elastic scattering, it is shown that in spite of the divergent behaviour of the unphysical form factors in the U-gauge, the fourth order corrections to the S-matrix elements of lepton-lepton elastic scattering are finite in the same gauge. (Author)

AD-780 476/8GA Reprint
Yale Univ New Haven Conn Dept of Physics
POSITRONIUM AND MUONIUM.
Vernon W. Hughes. 1973, 36p AFOSR-TR-74-0859
Contract F44620-71-C-0042, Grant NSF-GP-23722
Sponsored in part by Atomic Energy Commission
Contract AT11-1)-3075, Rept. no. COO-3075-54.

Descriptors: *Positrons, *Muons, *Interactions, Quantum theory, Electrodynamics, Ground state, Annihilation reactions.
Identifiers: *Muonium, *Postronium.

Positronium and muonium are atoms composed of leptons only. Studies and interactions of these atoms are therefore of interest for quantum electrodynamics as well as for atomic collisions, chemistry and the physics of condensed matter. Within this context, the current states of our knowledge of the fine structure interval and the annihilation rates in the ground state of positronium and the fine structure interval and the Zeeman effect in the ground state of muonium are reviewed. (Author)

AERE-R-7373 PC$4.00/MF$1.45
Ukaea Research Group, Harwell. Atomic Energy Research Establishment.
SOME BACKGROUND AND INTERFERENCE CHARACTERISTICS OF INTERMEDIATE STRUCTURE IN THE FISSION REACTION.
J. E. Lynn. Jan 74, 19p

Descriptors: (*Fission, *Intermediate structure), Cross sections, Interference, Intermediate resonance, Mathematical models, Potential energy.

For abstract, see NSA 29 12, number 30831.

ANL/HEP-7404 PC$5.00/MF$1.45
Ohio State Univ., Columbus (Usa). Dept. Of Physics; Argonne National Lab., Ill. (Usa).
EQUIVALENT EXCLUSIVE AND INCLUSIVE MULTIPERIPHERAL DESCRIPTIONS.
S. S. Pinsky, and G. H. Thomas. Jan 74, 40p COO-1545-136
Contract AT(11-1)-1545

Descriptors: (*Multiperipheral model, *Inclusive interactions), Differential cross sections, Lippmann-schwinger equation, Quantum numbers, Regge cuts, Regge poles, Singularity.

For abstract, see NSA 29 12, number 30519.

ANL/NDM-5 PC$6.25/MF$1.45
Argonne National Lab., Ill. (Usa).
DELAYED NEUTRON DATA: REVIEW AND EVALUATION.
S. A. Cox. Apr 74, 62p
Contract W-7405-eng-38

Descriptors: (*Delayed neutrons, *Energy spectra), (*Uranium 233, *Neutron reactions), (*Uranium 235, Neutron reactions), (*Uranium 238, Neutron reactions), Energy dependence, Fast fission, Fission yield, Multiplicity, Nuclear data collections, Plutonium 239, Plutonium 240, Plutonium 241, Reviews, Thorium 232, Time dependence.

For abstract, see NSA 29 12, number 30821.

BNL-18670 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
K EXP - P IMPLIES SIGMA EXP 0 PI EXP 0 CROSS SECTION BETWEEN 1575 AND 1710-MEV CM ENERGY RANGE WITH DETECTION OF GAMMAS.
R. Y. L. Chu, G. W. London, and Y. P. Yu. 1973, 16p CONF-730477-1

Descriptors: (*Lambda-1670 resonances, *Decay), (*Lambda-1690 resonances, Decay), (*Kaon-proton interactions, *Cross sections), Branching ratio, Gev range 10-100, Kaons minus, Lambda particles, Linear momentum, Mev range 100-1000, Particle production, Pions neutral, Sigma neutral.

For abstract, see NSA 29 12, number 30512.

BNL-18671 PC$3.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
K EXP - P IMPLIES LAMBDA EXP 0 PI EXP 0 PI EXP 0 AND K EXP - P IMPLIES SIGMA EXP 0 PI EXP 0 PI EXP 0 FORMATION IN THE 1570 TO 1750 MEV C.M. REGION.
R. Y. L. Chu, G. W. London, and Y. P. Yu. 1973, 12p CONF-730943-12

Descriptors: (*Sigma-1385 resonances, *Particle production), (*Lambda-1405 resonances, Particle production), Bubble chambers, Cross sections, Dalitz plot, Gev range 01-10, Kaon-proton interactions, Lambda particles, Pions minus, Pions neutral, Sigma neutral.

For abstract, see NSA 29 12, number 30513.

BNL-18672 PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
ANALYSIS OF THE INTERACTION K EXP - P IMPLIES SIGMA EXP 0 PI EXP 0 IN THE 1575 TO 1750 MEV REGION.
R. Y. L. Chu, G. W. London, and Y. P. Yu. 1973, 16p CONF-730943-13

Descriptors: Bubble chambers, Differential cross sections, Gev range 01-10, Kaon-proton interactions, Kaons minus, Particle production, Pions neutral, Sigma neutral, Total cross sections.

For abstract, see NSA 29 12, number 30511.

BNL-18736 PC$4.00/MF$1.45
Brookhaven National Lab., Upton, N.Y. (Usa).
PROTON--PROTON ELASTIC SCATTERING AT LARGE MOMENTUM TRANSFER.
J. Russ. Mar 74, 9p

Descriptors: (*Proton-proton interactions, *Elastic scattering), Differential cross sections, Linear momentum transfer.

For abstract, see NSA 29 12, number 30497.

COM-74-50515/7GA Not available NTIS
National Bureau of Standards, Washington, D.C.
TRANSORMATION BETWEEN CURRENT AND CONSTITUENT QUARKS AND TRANSITIONS BETWEEN HADRONS.
Final rept.,
Frederick J. Gilman, Moshe Kugler, and Sydney Meshkov. 1 Feb 74, 21p
Pub. in Physical Review D, v9 n3 p715-735, 1 Feb 74.

Descriptors: *Elementary particle theories, Transformations.
Identifiers: Quarks, Hadrons.

The transformation from current- to constituent-quark basis states is discussed. Certain algebraic properties of the transformed vector and axial-vector currents are abstracted from the free-quark model and assumed to hold in nature. Supplemented by the partially conserved axial-vector current hypothesis and assumptions about the identification of the observed hadrons with simple constituent-quark states, the algebraic properties of the transformed currents are used to compute the pion and photon transitions between any two hadron states. General selection rules are stated. Many specific matrix elements for both meson and baryon decays are tabulated, and both their magnitudes and signs are compared with experiment.

COM-74-50518/1GA Not available NTIS
National Bureau of Standards, Washington, D.C.
AGE OF CALIFORNIUM-252 FISSION NEUTRONS TO INDIUM RESONANCE ENERGY IN WATER.
Final rept.,
V. Spiegel. 1974, 7p
Pub. in Nuclear Science and Engineering, v54 p28-34 1974.

Descriptors: *Californium isotopes, *Fission neutrons, *Indium.
Identifiers: *Californium 252.

The age of 252 Cf fission neutrons to indium resonance energy (1.44 eV) was measured in water using a source encapsulated in a 7.6-mm-diam by 7.6-mm-high cylinder. The correction for the displacement of the moderator by the source was experimentally determined to be -0.13 cm squared or about -0.5% in approximate agreement with calculation. The distribution of indium resonance energy neutrons close to the source was measured to be Gaussian. The age measured for this experiment was 28.69 plus or minus 0.39 cm squared. An average energy for the 252Cf neutron spectrum of 2.21 plus or minus 0.05 MeV is inferred from this age.

CONF-740104-19 PC$3.00/MF$1.45
Argonne National Lab., Ill. (Usa).
PARTICLE EMISSION BY FISSION.
T. H. Blewitt, M. A. Kirk, D. E. Busch, A. C. Klank, and T. L. Scott. Feb 74, 9p

Descriptors: (*Uranium 235, Neutron reactions), (*Neutron reactions, *Fission), (*Niobium, *Sputtering), (*Copper, Sputtering), Aluminium, Thermal neutrons.

For abstract, see NSA 29 12, number 30822.

CONF-740105-1 PC$4.00/MF$1.45
Unisor, Oak Ridge, Tenn. (Usa).
INITIAL UNISOR RESEARCH: NEW ISOTOPES EXP 186 TL, EXP 188 TL, EXP 116 I; DECAYS OF EXP 189 EXP 190 TL, EXP 117 XE, AND EXP 117 I; AND OFF-LINE ATOMIC AND NUCLEAR STUDIES.
J. H. Hamilton, E. H. Spejewski, and R. L. Mlekodaj. 1974, 40p

Descriptors: (*Xenon 117, *Beta-plus decay), Energy levels, Half-life, Iodine 117, Branching ratio, Ft value, Gamma spectra, Ground states, Iodine 116, Parity, Q-value, Spin, Electron capture decay, Thallium 190, Mercury 190, Vibrational states, Xenon 116.

For abstract, see NSA 29 12, number 30770.

COO-1195-281 PC$3.00/MF$1.45
Illinois Univ., Urbana (Usa).
CERN--IHEP IN OUR UNDERSTANDING OF THE (3 PI EXP -) AND (ANTI K PI PI) EXP - STATES.
G. Ascoli. 1974, 3p CONF-740408-1

Descriptors: (*Pion-proton interactions, *Research programs), (*Kaon-proton interactions, Research programs), (*Meson resonances, Research programs).

For abstract, see NSA 29 12, number 30514.

COO-1195-284 PC$4.00/MF$1.45
Illinois Univ., Urbana (Usa).
COHERENT PION DISSOCIATION INTO THREE PIONS ON HEAVY NUCLEI.
U. E. Kruse, and T. J. Roberts. Mar 74, 9p
Contract AT(11-1)-1195

Descriptors: (*Carbon, *Pion reactions), (*Aluminium 27, Pion reactions), (*Copper, Pion reactions), (*Silver, Pion reactions), Coherent production, D states, Dissociation, Distribution, Gev range 10-100, Linear momentum, Partial waves, Pions, Pions minus, S states, Scale invariance.

For abstract, see NSA 29 12, number 30614.

COO-1428-344 PC$4.00/MF$1.45
Purdue Research Foundation, Lafayette, Ind. (Usa).
STUDY RARE DECAYS OF MESONS USING THE OMEGA SPECTROMETER.
B. Ghidini, F. Navach, and M. Palano. 3 Oct 73, 14p

Descriptors: (*Meson resonances, *Decay), Antiprotons, Kaons minus, Mass spectra, Pion-proton interactions, Spectrometers.

For abstract, see NSA 29 12, number 30515.

COO-1428-369 PC$4.00/MF$1.45
Purdue Univ., Lafayette, Ind. (Usa).
OBSERVATION OF INCREASING CHARGED MULTIPLICITY AS A FUNCTION OF TRANSVERSE MOMENTUM IN 28.5 GEV/C PP INTERACTIONS.
L. J. Gutay, A. Laasanen, and K. Stanfield. 1973, 13p CONF-730976-3, BNL-18175

Descriptors: (*Proton-proton interactions, *Multiple production), Gev range 10-100, Linear momentum, Missing mass, Multiplicity, Protons.

For abstract, see NSA 29 12, number 30498.

COO-1428-370 PC$3.00/MF$1.45
Purdue Univ., Lafayette, Ind. (Usa). Dept. Of Physics.
CHARGED MULTIPLICITY ASSOCIATED WITH TRANSVERSE MOMENTUM OF A LEADING PROTON IN PP AT 28.5 GEV/C.
A. Ramanuaukas, E. W. Anderson, and G. P. Fisher. 1973, 8p CONF-730841-2

Descriptors: (*Proton-proton interactions, *Multiple production), Bubble chambers, Gev range 10-100, Linear momentum, Missing mass, Multiplicity, Particle production, Protons.

For abstract, see NSA 29 12, number 30499.

COO-1428-373 PC$4.75/MF$1.45
Stanford Linear Accelerator Center, Calif. (Usa).
PROPOSAL TO STUDY SOME RARE PION AND KAON INDUCED REACTIONS USING THE 40" RAPID CYCLING SYSTEM.
18 Feb 74, 32p

Descriptors: (*Meson resonances, *Decay), Antineutrons, Antiprotons, Bubble chambers, Correlations, Hyperons, Kaon-proton interactions, Kaons minus, Kaons neutral, Kaons plus, Lambda particles, N*resonances, Particle production, Pion-proton interactions, Pions neutral, Pions plus, Protons, Rho-1670 resonances, Y*resonances.

For abstract, see NSA 29 12, number 30516.

COO-2167-2 PC$8.00/MF$1.45
Michigan Univ., Ann Arbor (Usa). Cyclotron Lab.
ANNUAL REPORT, MAY 1, 1972--JUNE 15, 1973.
1973, 97p
Contract AT(11-1)-2167

Descriptors: (*Cyclotrons, *Beam dynamics), (*Nuclear physics, *Research programs), Michigan, Operation, Orbits, Time-of-flight method.

For abstract, see NSA 29 12, number 30771.

COO-2271-26 PC$4.00/MF$1.45
Columbia Univ., New York (Usa). Dept. Of Physics.
DETAILED PREDICTIONS FOR THE P-N STRUCTURE FUNCTIONS IN THEORIES WITH COMPUTABLE LARGE MOMENTA BEHAVIOUR.
G. Parisi. 1973, 6p

Descriptors: (*Protons, *Structure functions), (*Neutrons, Structure functions), Gauge invariance, Gluon model, Quark model, Strong interactions, Su-3 groups.

For abstract, see NSA 29 12, number 30598.

COO-3071-29 PC$4.50/MF$1.45
Pennsylvania Univ., Philadelphia (Usa). Dept. Of Physics.
SEARCH FOR MASSIVE LONG LIVED PARTICLES IN ALUMINUM TARGETS IRRADIATED BY 300 GEV AND 400 GEV PROTONS.
S. Frankel, W. Frati, L. Resvanis, W. Yang, and F. Nezrick. 11 Sep 73, 28p

Descriptors: (*Aluminium, *Proton reactions), (*Magnetic monopoles, *Particle production), Boundary conditions, Cosmic radiation, Cross sections, Elementary particles, Gev range 100-1000, Lifetime, Mass.

For abstract, see NSA 29 12, number 30500.

COO-3071-34 PC$4.00/MF$1.45
Pennsylvania Univ., Philadelphia (Usa). Dept. Of Physics.
STRUCTURE OF THE A=6 NUCLEAR SYSTEM.
J. D. Vergados. 11 Jul 73, 20p

Descriptors: (*Lithium 6, *Energy levels), (*Helium 6, *Beta-minus decay), (*Pion reactions, *Capture), Shell models, Wave functions, Ft value, Ground states, Level widths, Magnetic dipole moments, Quadrupole moments, Cross sections, Gamma radiation, Pions minus.

For abstract, see NSA 29 12, number 30715.

COO-3071-35 PC$4.00/MF$1.45
Pennsylvania Univ., Philadelphia (Usa). Dept. Of Physics.
OBSERVATION OF MUONLESS NEUTRINO-INDUCED INELASTIC INTERACTIONS.
A. Benvenuti, D. C. Cheng, D. Cline, W. T. Ford, and R. Imlay. 1973, 16p

Descriptors: (*Neutrino reactions, *Inelastic scattering), Antineutrinos, Final-state interactions, Gev range 100-1000, Neutral currents.

For abstract, see NSA 29 12, number 30491.

COO-3071-49 PC$4.00/MF$1.45
Pennsylvania Univ., Philadelphia (Usa). Dept. Of Physics.
POSSIBLE MEASUREMENT OF THE VACUUM POLARIZATION IN HEAVY ION SCATTERING.
J. Rafelski, and A. Klein. 1973, 15p

Descriptors: (*Carbon 12 reactions, *Elastic scattering), (*Lead 208, Carbon 12 reactions), Cross sections, Linear momentum transfer, Mev range 10-100, Photons, Propagator, Vacuum polarization.

For abstract, see NSA 29 12, number 30817.

DESY-73-64 PC$5.75/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
QUASI-THREE-BODY E EXP + E EXP - ANNIHILATION.
A. C. Hirshfeld, and G. Kramer. Dec 73, 53p

Descriptors: (*Electron-positron interactions, *Annihilation), Angular distribution, A1-1070 resonances, Cross sections, Electroproduction, Final-state interactions, Form factors, Helicity, Interference, Ope model, Pions, Resonance, Rho-765 resonances, Three-body problem, Vector dominance model.

For abstract, see NSA 29 12, number 30528.

DESY-73-65 PC$4.25/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
CONTRIBUTIONS OF MULTIPHOTON EXCHANGE IN EP DEEP INELASTIC SCATTERING.
J. Bartels. Dec 73, 22p

Descriptors: (*Electron-proton interactions, *Boson-exchange models), Boundary conditions, Corrections, Cross sections, Exchange interactions, Feynman diagram, Inelastic scattering, Light cone, Parton model, Photons, Quark model, Structure functions.

For abstract, see NSA 29 12, number 30529.

DESY-74-2 PC$5.25/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
COVARIANT PERTURBATION EXPANSION IN CHIRAL THEORIES WITH PIONS AND NUCLEONS.
M. Daniel, and R. R. Horgan. Jan 74, 45p

Descriptors: (*Nucleons, Chirality), (*Pions, Chirality), (*Chirality, *Perturbation theory), Mass, Particle models, Series expansion.

For abstract, see NSA 29 12, number 30585.

DESY-74-3 PC$4.50/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
ALTERNATIVES TO THE VENEZIANO AMPLITUDE.
E. Weimar. Jan 74, 26p

Descriptors: (*Dual resonance model, *Scattering amplitudes), Mathematical operators, Scalars.

For abstract, see NSA 29 12, number 30520.

DP-1346 PC$4.00/MF$1.45
Du Pont de Nemours (E.I.) and CO., Aiken, S.C. (Usa). Savannah River Lab.
STANDARD THERMAL ENERGY GROUP STRUCTURE FOR GENERATION OF THERMAL GROUP CONSTANTS FROM ENDF/B DATA.
D. R. Finch. Mar 74, 32p
Contract AT(07-2)-1

Descriptors: Group constants, Multigroup theory, Neutron reactions, Nuclear data collections, Standards, Thermal neutrons.

For abstract, see NSA 29 12, number 30681.

FRNC-TH-450 PC$8.25/MF$1.45
Paris-11 Univ., 91 - Orsay (France).
STUDY OF NEUTRON STRENGTH FUNCTIONS AND THE OPTICAL MODEL AT VERY LOW ENERGIES.
J. P. Delaroche. 1972, 105p
In French.

Descriptors: (*Neutron reactions, *Capture), (*Holmium 166, *Energy levels), Compound-nucleus reactions, Coupled channel theory, Cross sections, Epithermal neutrons, Ev range 10-100, Ev range 100-1000, Gamma radiation, Intermediate neutrons, J-j coupling, Optical models, Resonance neutrons, Strength functions, Holmium 165, Isospin, Polarized beams, Polarized targets, S waves, Spin, Tellurium isotopes, Tin isotopes, Xenon isotopes, Resonance.

For abstract, see NSA 29 12, number 30773.

FRNC-TH-452 PC$9.00/MF$1.45
Paris-11 Univ., 91 - Orsay (France).
ELASTIC SCATTERING OF 21 TO 29.6 MEV ALPHA PARTICLES ON NUCLEI IN THE TI--ZN REGION.
O. F. Lemos. 1972, 117p
In French.

Descriptors: (*Alpha reactions, *Elastic scattering), (*Titanium 46, Alpha reactions), (*Chromium 50, Alpha reactions), (*Chromium 52, Alpha reactions), Angular distribution, Differential cross sections, Energy dependence, Iron 54, Iron 56, Mev range 10-100, Nickel 58, Nickel 60, Nickel 62, Nickel 64, Nuclear potential, Optical models, Zinc 64.

For abstract, see NSA 29 12, number 30748.

HEDL-TME-71-51 PC$4.25/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
MEASUREMENT OF NUCLEAR DECAY HEATING OF TANTALUM SPECIMENS IRRADIATED IN THE EBR-II.
J. L. Straalsund, and R. E. Dahl. Apr 71, 22p
Contract AT(45-1)-2170

Descriptors: (*Tantalum 182, *Decay), (*Tantalum, *Neutron reactions), Calorimeters, Ebr-2 reactor, Fftf reactor, Heating, Irradiation.

For abstract, see NSA 29 12, number 30150.

IC-73-194 PC$8.00/MF$1.45
International Centre for Theoretical Physics, Trieste (Italy).
CURRENT ALGEBRA AND LIGHT CONE (LECTURE NOTES).
G. Furlan, and N. Paver. Dec 73, 100p

Descriptors: (*Quark model, Current algebra), (*Current algebra, *Light cone), Linear momentum, Reviews.

For abstract, see NSA 29 12, number 30521.

IFVE-STF-73-61 PC$4.00/MF$1.45
Gosudarstvennyj Komitet Po Ispol'Zovaniyu Atomnoj Ehnergii Sssr, Serpukhov. Inst. Fiziki Vysokikh Ehnergij.
ANALYSIS OF N-SCATTERING AND HIGH ENERGY BY THE METHOD OF DISPERSION RELATIONS.
L. D. Solov'ev, and A. V. Shchelkachev. 1973, 18p
In Russian.

Descriptors: (*Pion-proton interactions, *Dispersion relations), Differential cross sections, Neutrons, Particle production, Pions minus, Pions neutral, Pions plus, Total cross sections.

For abstract, see NSA 29 12, number 30599.

INP-857 PC$4.00/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
ABOUT SOME FEATURES OF THE ANGULAR DISTRIBUTIONS OF PARTICLES PRODUCED IN INTERACTIONS OF PROTONS WITH EMULSION NUCLEI AT 67 GEV AND 200 GEV.
A. Jurak. Nov 73, 15p
In Polish.

Descriptors: (*Multiple production, *Angular distribution), Decay, Differential cross sections, Gev range 10-100, Gev range 100-1000, Nuclear emulsions, Proton reactions.

For abstract, see NSA 29 12, number 30501.

INS-J-143 PC$5.25/MF$1.45
Tokyo Univ., Tanashi (Japan). Inst. For Nuclear Study.
POLARIZATION OF RECOIL PROTONS IN ETA-MESON PHOTOPRODUCTION AT 890 MEV.
K. Ukai. 21 Jan 74, 42p

Descriptors: (*Eta mesons, *Photoproduction), (*Photon-proton interactions, *Polarization), (*N-1535 resonances, Photoproduction), (*N-1520 resonances, Photoproduction), Differential cross sections, Mev range 100-1000, Protons, Recoils.

For abstract, see NSA 29 12, number 30485.

ITF-73-152-P PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
DISPERSION RELATIONS FOR AVERAGED AMPLITUDES.
E. P. Sabad, Yu. M. Lomsadze, and B. A. Agranovskii. 1973, 11p
In Russian.

Descriptors: (*Pion-nucleon interactions, *Scattering amplitudes), Dispersion relations, Functions.

For abstract, see NSA 29 12, number 30600.

ITF-73-160-P PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
INTEGRAL RELATIONS WITH DAMPING FUNCTION FOR FORWARD SCATTERING AMPLITUDE.
B. A. Agranovskii. 1973, 18p
In Russian.

Descriptors: (*Pion-nucleon interactions, *Scattering amplitudes), Boundary conditions, Damping, Energy, Integrals.

For abstract, see NSA 29 12, number 30601.

ITF-73-161-P PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
DEUTERON DIFFRACTION BREAKUP ON NUCLEI WITH DIFFUSE BOUNDARIES.
A. G. Sitenko, A. D. Polozov, and M. V. Evlanov. 1973, 19p
In Russian.

Descriptors: (*Deuteron reactions, *Breakup reactions), Cross sections, Diffraction, Mass number, Nuclear radii, Nuclei, Shape.

For abstract, see NSA 29 12, number 30832.

ITF-73-165-P PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
MELLIN POLES AND STRUCTURE FUNCTIONS.
V. G. Kozyrskii. 1973, 12p
In Russian.

Descriptors: (*Structure functions, *Scale invariance), Mellin transform.

For abstract, see NSA 29 12, number 30522.

ITF-73-173-P PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
POLARIZATION PHENOMENA UNDER FAST ELECTRON SCATTERING BY DEUTERONS.
E. M. Malyarzh, and V. K. Tartakovskii. 1973, 12p
In Russian.

Descriptors: (*Electron-deuteron interactions, *Polarization), (*Nucleons, Polarization), D waves, Deuterons, Energy levels, Ground states, Scattering, Trajectories, Wave functions.

For abstract, see NSA 29 12, number 30530.

ITF-73-46-E PC$5.75/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
FEYNMAN AMPLITUDE AND THE MEIJER'S FUNCTION. A UNIFIED REPRESENTATION FOR DIVERGENT AND CONVERGENT GRAPHS.
V. I. Kucheryavyi. 1973, 47p

Descriptors: (*Feynman diagram, *Scattering amplitudes), Diagrams, Gauge invariance, Photons, Quantum electrodynamics, Renormalization, Scalars, Scale invariance, Spinors, Symmetry breaking, Ward identity.

For abstract, see NSA 29 12, number 30639.

JINR-E1-7669 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
LOW ENERGY LAMBDA P SCATTERING.
B. A. Shakhbazyan, A. A. Timonina, and N. A. Kalinina. 1974, 10p CONF-730642-17

Descriptors: (*Carbon 12, *Neutron reactions), (*Nucleon-hyperon interactions, *Elastic scattering), (*Lambda particles, Nucleon-hyperon interactions), (*Protons, Nucleon-hyperon interactions), Baryon-baryon interactions, Cross sections, Gev range 01-10, Linear momentum, Mass spectra, Pion reactions, Resonance.

For abstract, see NSA 29 12, number 30502.

JINR-E2-7563 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
RELATIVISTIC MODEL OF COMPOSITE MESONS.
A. T. Filippov. 1973, 12p

Descriptors: (*Mesons, *Composite models), (*Pions, Composite models), (*Meson resonances, *Mass spectra), Antiparticles, Bethe-salpeter equation, Distance, Fermions, Mass, Relativistic range, Resonance particles, Singularity.

For abstract, see NSA 29 12, number 30586.

JINR-E2-7618 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
NONZERO MASSES OF PI , K, ETA, AND K MESONS AND ALGEBRAIC REALIZATION OF SU(3) X SU(3) CHIRAL SYMMETRY.
A. Z. Dubnickova. 1973, 12p
In Russian.

Descriptors: (*Pions, *Mass), (*Kaons, Mass), (*Eta mesons, Mass), (*Kappa-725 resonances, Mass), Chiral symmetry, Helicity, Lagrangian function, Mathematical operators, Su-2 groups, Su-3 groups, Symmetry breaking, Virtual states.

For abstract, see NSA 29 12, number 30636.

JINR-E2-7638 PC$4.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
GENERALIZED SUM RULES FROM LIGHT-CONE CURRENT ANTICOMMUTATORS.
J. Moulin. 1973, 24p

Descriptors: (*Current commutators, *Light cone), (*Lepton-hadron interactions, *Structure functions), (*Quark model, Current commutators), (*Neutrino-nucleon interactions, *Sum rules), Axial-vector currents, Boundary conditions, Current algebra, Mass, Matrix elements, Particle production, Vector currents.

For abstract, see NSA 29 12, number 30563.

JINR-E7-7636 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.

QUASIMOLECULAR KX-RAY EXCITATION BY BOMBARDMENT OF GE ATOMS WITH GE IONS.
P. Gippner, K. H. Kaun, F. Stary, W. Schulze, and Yu. P. Tret'yakov. 1973, 12p

Descriptors: (*Germanium 74, *Heavy ion reactions), (*Germanium, Heavy ion reactions), Cations, Corrections, Distribution, Energy spectra, Excitation, Mev range 10-100, Molecules, Nuclear reaction yield, Transients, X radiation.

For abstract, see NSA 29 12, number 30760.

JINR-P10-7681 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
STATISTICAL ANALYSIS OF K GREATER THAN OR EQUAL TO 2 GAMMA-QUANTUM SYSTEMS ACCOMPANYING THE NUCLEAR INTERACTIONS AT HIGH ENERGIES.
B. Slovinskii. 1974, 8p
In Russian.

Descriptors: (*Photons, *Multiple production), Bubble chambers, Nuclear reactions, Statistics.

For abstract, see NSA 29 12, number 30532.

JINR-P15-7682 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Neutron Physics.
STUDY OF THE ENERGY AND ANGULAR DEPENDENCE OF THE SPIN-FLIP PROBABILITY AT INELASTIC SCATTERING OF PROTONS ON EXP 24 MG.
S. L. Golubev, A. B. Kurepin, V. N. Likhosherstov, G. M. Osetinskii, and M. A. Faruk. 1974, 20p
In Russian.

Descriptors: (*Magnesium 24, Proton reactions), (*Proton reactions, *Inelastic scattering), Angular distribution, Differential cross sections, Isotropy, Mev range 01-10, Probability, Resonance, S waves, Spin.

For abstract, see NSA 29 12, number 30733.

JINR-P2-7659 PC$4.75/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
TWO-BODY PROBLEM IN ADIABATIC AND STRONG COUPLING.
E. P. Solodovnikova, and A. N. Tavkhelidze. 1974, 32p
In Russian.

Descriptors: (*Strong-coupling model, *Two-body problem), Adiabatic approximation, Bogolyubov transformation, Coupling, Hadron-hadron interactions, Hadrons, Kinetics, Motion, Strong interactions.

For abstract, see NSA 29 12, number 30574.

JINR-P2-7675 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
ALGEBRA OF CURRENTS AND CLASSIFICATION OF HADRONS.
1974, 20p
In Russian.

Descriptors: (*Hadrons, *Current algebra), Algebra, Annihilation, Antiparticles, Creation operators, Hilbert space, Irreducible representations, Mathematical space, Su-6 groups, Vectors.

For abstract, see NSA 29 12, number 30575.

JINR-P2-7687 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of High Energy.
PRODUCTION OF HIGH ENERGY PIONS IN DEUTERON--NUCLEUS COLLISIONS ACCORDING TO IMPULSE APPROXIMATION MODEL.
S. B. Gerasimov, and N. Giordeneskii. 1974, 20p
In Russian.

Descriptors: (*Deuteron reactions, *Inclusive interactions), (*Copper, Deuteron reactions), Cross sections, Impulse approximation, Motion, Nucleons, Particle production, Pions.

For abstract, see NSA 29 12, number 30761.

JINR-P2-7694 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Nuclear Reactions.
CALCULATION OF ELECTRONUCLEAR METHOD FOR NEUTRON PRODUCTION.
V. S. Barashenkov, V. D. Toneev, and S. E. Chigrinov. 1974, 16p
In Russian.

Descriptors: (*Proton reactions, *Fission), (*Fission neutrons, *Multiplicity), (*Lead 207, Proton reactions), (*Uranium 238, Proton reactions), Evaporation model, Gev range 01-10, Kinetic energy, Mev range 100-1000, Monte carlo method, Neutron sources, Neutron spectra, Nuclear cascades, Uranium.

For abstract, see NSA 29 12, number 30823.

JINR-P2-7710 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
EQUAL TIME COMMUTATOR IN THE MATRIX ELEMENT <0(A/SUB MU //SUP 1+I2/(X), A/SUB NU //SUP 1-I2/(0)) RHO EXP 0 (P,LAMBDA)> AND LOCALITY.
D. G. Fakirov. 1974, 12p
In Russian.

Descriptors: (*Commutators, *Matrix elements), Current algebra, Spectral functions, Sum rules, Time dependence.

For abstract, see NSA 29 12, number 30523.

JINR-P3-7634 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Neutron Physics.
POSSIBLE EXPERIMENTAL STUDY OF DIRECT N--E COLLISIONS.
Yu. A. Aleksandrov, and I. M. Matora. 1973, 8p
In Russian.

Descriptors: (*Electron-neutron interactions, *Statistics).

For abstract, see NSA 29 12, number 30531.

JINR-P4-7627 PC$4.50/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
PHOTODISINTEGRATION OF EXP 13 C.
A. Asvad, G. U. Eger, H. R. Kissener, and R. A. Eramzhyan. 1973, 27p
In Russian.

Descriptors: (*Carbon 13, *Photonuclear reactions), Bound state, Branching ratio, Emission, Energy spectra, Energy-level transitions, Final-state interactions, Nucleons, R matrix, Resonance, Shell models, Total cross sections.

For abstract, see NSA 29 12, number 30716.

JUL-1003-AC(Vols.1,2,3) PC$53.00/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Zentralinstitut fuer Analytische Chemie.
GAMMA-RAY LINES OF THE RADIONUCLIDES. VOLUMES 1, 2, AND 3.
G. Erdtmann, and W. Soyka. Sep 73, 1151p
In German and English.

Descriptors: (*Light nuclei, *Decay), (*Heavy nuclei, Decay), (*Intermediate mass nuclei, Decay), (*Radioisotopes, *Gamma spectra), Data, Gamma radiation, Half-life, Tables.

For abstract, see NSA 29 12, number 30774.

LA-5473-MS PC$7.60/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
MULTI: A FORTRAN CODE FOR LEAST-SQUARES SHAPE FITTING OF NEUTRON CROSS-SECTION DATA USING THE REICH--MOORE MULTILEVEL FORMALISM.
G. F. Auchampaugh. Mar 74, 202p
Contract W-7405-eng-36

Descriptors: (*Computer codes, *M codes), (*Neutron reactions, *Data processing), Cdc computers, Cross sections, D waves, Doppler broadening, F waves, Fission, Fortran, Least square fit, Multilevel analysis, Nuclei, P waves, R matrix, Reich-moore formula, S waves, Scattering, Total cross sections.

For abstract, see NSA 29 12, number 30682.

LBL-2144 PC$6.25/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
PHYSICS RESEARCH WITH HIGH-ENERGY HEAVY IONS.
H. Steiner. Sep 73, 82p CONF-730991-1
Contract W-7405-eng-48

Descriptors: Gev range, Heavy ion reactions, Lectures, Relativistic range.

For abstract, see NSA 29 12, number 30503.

LBL-2360 PC$11.75/MF$1.45
California Univ., Berkeley (Usa). Lawrence Berkeley Lab.
HIGH-RESOLUTION STUDIES OF BETA-DELAYED PROTON EMISSION IN LIGHT NUCLEI.
R. G. Sextro. Dec 73, 173p
Contract W-7405-eng-48

Descriptors: (*Calcium 37, *Beta-plus decay), (*Scandium 40, Beta-plus decay), (*Titanium 41, Beta-plus decay), (*Magnesium 21, Beta-plus decay), Aluminium 23, Branching ratio, Delayed protons, Ft value, Half-life, Proton spectra, Silicon 25, Compound-nucleus reactions, Excitation functions, Magnesium 24, Mev range 10-100, Neutrons, Proton reactions, Aluminium 25, Calcium 40, Energy levels, Magnesium 23, Potassium 37, Scandium 41, Sodium 21.

For abstract, see NSA 29 12, number 30734.

LNF-73-60 PC$4.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
QUARK MODEL PREDICTIONS FOR RADIATIVE DECAYS OF MESONS.
A. Bramon, and M. Greco. 9 Oct 73, 11p

Descriptors: (*Eta mesons, *Decay), (*Omega-784 resonances, Decay), (*Rho-765 resonances, Decay), (*Phi-1019 resonances, Decay), Configuration mixing, Particle widths, Pseudoscalar mesons, Quark model, Vector mesons.

For abstract, see NSA 29 12, number 30533.

LNF-73-61 PC$4.00/MF$1.45
Comitato Nazionale Per l'Energia Nucleare, Frascati (Italy). Laboratori Nazionali di Frascati.
FINITE DISPERSION RELATIONS APPROACH TO ETA IMPLIES PI EXP + PI EXP - GAMMA DECAY.
A. Bramon, and M. Greco. 11 Oct 73, 8p

Descriptors: (*Eta mesons, *Decay), Branching ratio, Dispersion relations, Emission, Particle widths, Photons, Pions minus, Pions plus.

For abstract, see NSA 29 12, number 30534.

NP-19969 PC$6.25/MF$1.45
International Centre for Theoretical Physics, Trieste (Italy).
EIGHTH ANNUAL REPORT, 1972.
1972, 64p

Descriptors: (*High energy physics, *Research programs), (*Nuclear physics, Research programs), Solids.

For abstract, see NSA 29 12, number 30524.

ORO-3820-24 PC$3.00/MF$1.45
Texas Agricultural and Mechanical Univ., College Station (Usa).
ON-LINE ALPHA AND PROTON DECAY SPECTROMETRY. ANNUAL PROGRESS REPORT, 1973.
R. D. Macfarlane. 15 Jan 74, 19p
Contract AT(40-1)-3820

Descriptors: (*Beta decay, *Research programs), Recoils, Surfaces.

For abstract, see NSA 29 12, number 30775.

ORO-3992-137 PC$4.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
ABSORBED MULTIPERIPHERAL-LIKE MODEL OF ELASTIC SCATTERING AND MULTIPARTICLE PRODUCTION IN HIGH ENERGY HADRON COLLISIONS.
C. B. Chiu, and K. H. Wang. 1973, 18p CPT-186
Contract AT(40-1)-3992

Descriptors: (*Proton-proton interactions, *Elastic scattering), (*Proton-antiproton interactions, Elastic scattering), Absorption, Differential cross sections, Distribution, Emission, Hadron-hadron interactions, Inclusive interactions, Linear momentum, Multiperipheral model, Multiple production, Multiplicity, Nucleons, Pions, Scattering amplitudes, Total cross sections.

For abstract, see NSA 29 12, number 30535.

ORO-3992-173 PC$4.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
UNIFIED THEORY OF WEAK AND ELECTROMAGNETIC INTERACTIONS WITHOUT HIGGS PHENOMENA.
N. G. Deshpande, D. A. Dicus, J. P. Hsu, and E. C. G. Sudarshan. 1974, 13p CPT-217

Descriptors: Boundary conditions, Electromagnetic interactions, Gauge invariance, Group theory, Isospin, Renormalization, Unitarity, Weak interactions.

For abstract, see NSA 29 12, number 30564.

ORO-3992-174 PC$4.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
UNIFIED THEORY OF WEAK AND ELECTROMAGNETIC INTERACTIONS WITHOUT SPONTANEOUSLY BROKEN GAUGE SYMMETRY. I.
J. P. Hsu, and E. C. G. Sudarshan. 1974, 12p CPT-218

Descriptors: Electromagnetic interactions, Fermions, Feynman diagram, Gauge invariance, Interactions, Intermediate vector bosons, Isospin, Lagrange equations, Lagrangian function, Mass, Photons, Propagator, Renormalization, S matrix, Scalars, Symmetry, Unitarity, Vector mesons, Weak interactions, Yang-mills theory.

For abstract, see NSA 29 12, number 30536.

ORO-3992-180 PC$4.25/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
ABSORPTION FORMALISM FOR MULTIPARTICLE PRODUCTION AND THE INCLUSIVE TRANSVERSE DISTRIBUTION.
C. B. Chiu, and K. H. Wang. 1974, 25p CPT-224
Contract AT(40-1)-3992

Descriptors: (*Multiperipheral model, *Absorption), (*Multiple production, Absorption), (*Inclusive interactions, *Linear momentum), (*Proton-proton interactions, Inclusive interactions), Distribution, Elastic scattering, Reviews, Unitarity.

For abstract, see NSA 29 12, number 30615.

ORO-4317-27 PC$6.50/MF$1.45
Maryland Univ., College Park (Usa). Dept. Of Physics and Astronomy.
ACCURACY OF THE DISTORTED WAVE IMPULSE APPROXIMATION (DWIA) FOR BREAKUP REACTIONS IN A THREE-BODY MODEL. TECHNICAL REPORT NO. 74-014.
S. K. Young, and E. F. Redish. Mar 74, 70p

Descriptors: (*Proton reactions, *Breakup reactions), (*Knock-out reactions, *Nuclear reaction kinetics), (*Helium 4, Proton reactions), Accuracy, Differential cross sections, Distorted wave theory, Dwba, Energy spectra, Faddeev equations, Finite-range interactions, Impulse approximation, Mev range 10-100, Multiple scattering, Nuclei, Proton spectra, Protons, Recoils, Three-body problem, Tritium.

For abstract, see NSA 29 12, number 30833.

ORO-4317-35 PC$4.50/MF$1.45
Maryland Univ., College Park (Usa). Dept. Of Physics and Astronomy.
TRITON BINDING ENERGIES WITH TWO-BODY RADIAL DISTORTION UNITARY TRANSFORMS. TECHNICAL REPORT 74-059.
J. P. Lavine, and G. J. Jr. Stephenson. Feb 74, 26p

Descriptors: (*Tritons, *Binding energy), Angular momentum, Nuclear matter, Nucleon-nucleon potential, Phase shift, S matrix, Three-body problem, Two-body problem, Unitarity, Yukawa potential.

For abstract, see NSA 29 12, number 30616.

ORO-4317-37 PC$4.00/MF$1.45
Maryland Univ., College Park (Usa). Dept. Of Physics and Astronomy.
INDICATIONS OF COMPOSITE STRUCTURE AT MEDIUM ENERGIES. TECHNICAL REPORT NO. 74-064.
D. D. Brayshaw. Feb 74, 12p

Descriptors: (*Pion-pion interactions, *Composite models), (*Nucleon-nucleon interactions, Composite models), Hadrons.

For abstract, see NSA 29 12, number 30587.

PTB-FMRB-51 PC$5.25/MF$1.45
Physikalisch-Technische Bundesanstalt, Braunschweig (F.R. Germany). Forschungs- und Messreaktor.
DIFFRACTION OF SLOW NEUTRONS ON SEMIPLANES.
H. Friedrich, and W. Heintz. Dec 73, 44p
In German.

Descriptors: (*Foils, *Neutron diffraction), Aluminium, Copper, Huygens principle, Manganese, Slabs, Slow neutrons.

For abstract, see NSA 29 12, number 30683.

RCN-205 PC$4.75/MF$1.45
Stichting Reactor Centrum Nederland, Petten.
RCN-1 PSEUDO FISSION-PRODUCT CAPTURE GROUP CROSS SECTIONS.
H. Gruppelaar. Jan 74, 34p

Descriptors: (*Fission products, Neutron reactions), (*Neutron reactions, *Capture), (*Snr reactor, *Reactivity worths), (*Stek reactor, Reactivity worths), Cross sections, Errors, Fast neutrons, Gamma radiation, Group constants, Mixtures, Neutron spectra.

For abstract, see NSA 29 12, number 30776.

RL-74-17 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
INCLUSIVE REACTION K EXP - P IMPLIES PX AT 14.3 GEV/C.
S. N. Tovey, K. Paler, and T. P. Shah. Jan 74, 18p

Descriptors: (*Kaon-proton interactions, *Inclusive interactions), Boundary conditions, Coupling, Differential cross sections, Gev range 10-100, Kaons minus, Linear momentum, Linear momentum transfer, Missing mass, Pions, Protons, Regge poles.

For abstract, see NSA 29 12, number 30602.

RL-74-22 PC$5.75/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
TRIPPLE-REGGE ANALYSIS OF PP IMPLIES PX AND SOME RELATED PHENOMENA: A DETAILED STUDY.
D. P. Roy, and R. G. Roberts. Jan 74, 52p

Descriptors: (*Proton-proton interactions, *Regge trajectories), Coupling, Cross sections, Diffraction models, Distribution, Energy dependence, Gev range 100-1000, Inelastic scattering, Mass, Multiple production, Multiplicity, Pomeranchuk particles, Pomeranchuk poles, Sum rules, Tev range.

For abstract, see NSA 29 12, number 30617.

RL-74-34 PC$4.00/MF$1.45
Science Research Council, Chilton (Uk). Rutherford High Energy Lab.
DIPOLE POMERON ANSATZ.
R. J. N. Phillips. Feb 74, 7p

Descriptors: (*Proton-proton interactions, Pomeranchuk particles), (*Pomeranchuk particles, *Dipoles), Boundary conditions, Cern isr, Elastic scattering, Energy range, Multiple scattering, Pomeranchuk poles, Regge poles, Scale invariance.

For abstract, see NSA 29 12, number 30618.

TID-26549 PC$11.75/MF$1.45
Michigan State Univ., East Lansing (Usa). Cyclotron Lab.
ANNUAL REPORT OF THE MICHIGAN STATE UNIVERSITY CYCLOTRON LABORATORY FOR THE PERIOD JULY 1, 1971--JULY 1, 1972.
Nov 72, 174p

Descriptors: (*Nuclear reactions, *Research programs), (*Nuclear properties, Research programs).

For abstract, see NSA 29 12, number 30835.

TLU-10-73 PC$4.50/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
NONCOPLANAR PROTON CORRELATIONS FROM THE D(P,2P)N REACTION AT 10.0 MEV.
B. Sundqvist, A. Johansson, L. Goenczi, and I. Koersner. Apr 73, 26p

Descriptors: (*Deuterium, Proton reactions), (*Proton reactions, *Breakup reactions), Angular distribution, Correlations, Cross sections, Energy spectra, Impulse approximation, Mev range 01-10, Neutrons, Nuclear reaction kinetics, Protons, Quasi-elastic scattering.

For abstract, see NSA 29 12, number 30692.

TLU-11-73 PC$4.25/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
TREIMAN--YANG TEST OF THE SPECTATOR MODEL IN THE D(P,2P)N REACTION AT 10.186 MEV.
B. Sundqvist, A. Johansson, L. Amten, L. Goenczi, and I. Koersner. Apr 73, 22p

Descriptors: (*Deuterium, Proton reactions), (*Proton reactions, *Breakup reactions), Cross sections, Mev range 10-100, Neutrons, Nuclear reaction kinetics, Protons, Quasi-elastic scattering, Spectra.

For abstract, see NSA 29 12, number 30693.

TLU-12-73 PC$4.11/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
CALCULATION OF THE D(P,2P)N REACTION CROSS SECTION FOR LOW PROTON ENERGIES USING FIRST AND SECOND ORDER TERMS IN THE MULTIPLE SCATTERING FORMULA.
B. Sundqvist, and A. Johansson. Apr 73, 18p

Descriptors: (*Deuterium, Proton reactions), (*Proton reactions, *Breakup reactions), Cross sections, Energy spectra, Final-state interactions, Impulse approximation, Mev range 01-10, Mev range 10-100, Multiple scattering, Neutrons, Nuclear reaction kinetics, Numerical solution, Protons.

For abstract, see NSA 29 12, number 30694.

TLU-13-73 PC$4.50/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
EXCITATION FUNCTION FOR THE D(P,2P)N REACTION FOR 8.5 LESS THAN OR EQUAL TO T/SUB P/ LESS THAN OR EQUAL TO 11.6 MEV.
B. Sundqvist, A. Johansson, L. Amten, L. Glantz, and L. Goenczi. Apr 73, 29p

Descriptors: (*Deuterium, Proton reactions), (*Proton reactions, *Breakup reactions), Correlations, Cross sections, Excitation functions, Impulse approximation, Mev range 01-10, Mev range 10-100, Neutrons, Proton beams, Protons.

For abstract, see NSA 29 12, number 30504.

TLU-14-73 PC$4.00/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
MEASUREMENT OF THE DIFFERENTIAL CROSS SECTION FOR ELASTIC PROTON DEUTERON SCATTERING AT 10.00 MEV.
B. Sundqvist, A. Johansson, and L. Glantz. Apr 73, 20p

Descriptors: (*Deuterium, Proton reactions), (*Proton reactions, *Elastic scattering), Angular distribution, Differential cross sections, Mev range 01-10.

For abstract, see NSA 29 12, number 30695.

TLU-15-73 PC$5.75/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
LOW-ENERGY PROTON INDUCED DEUTERON BREAKUP ANALYZED WITH THE SEPARABLE POTENTIAL MODEL.
B. Sundqvist, and A. Johansson. Apr 73, 53p

Descriptors: (*Proton reactions, *Breakup reactions), (*Deuterium, Proton reactions), Asymmetry, Correlations, Deuterons, Energy spectra, Green function, Nuclear potential, Numerical solution, Proton beams, Scattering, Schroedinger equation, Symmetry, Three-body problem, Two-body problem.

For abstract, see NSA 29 12, number 30696.

TLU-21-73 PC$4.00/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
ISOSPIN EFFECTS IN FAST NEUTRON RADIATIVE CAPTURE.
L. Nilsson, and J. Eriksson. Dec 73, 9p

Descriptors: (*Neutron reactions, *Capture), (*Mirror nuclei, Neutron reactions), (*Calcium 40, Neutron reactions), Calcium 41, Cross sections, Excitation functions, Fast neutrons, Gamma radiation, Giant resonance, Isospin, Mev range 01-10, Mev range 10-100, Numerical solution.

For abstract, see NSA 29 12, number 30836.

TLU-23-73 PC$4.00/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
FORM FACTOR DEPENDENCE OF PROTON INDUCED DEUTERON BREAKUP AT LOW ENERGY.
W. Ebenhoeh, B. Sundqvist, A. Johansson, L. Amten, and L. Glantz. Dec 73, 10p

Descriptors: (*Deuterium, Proton reactions), (*Proton reactions, *Breakup reactions), Correlations, Coulomb field, Differential cross sections, Form factors, Mev range 01-10, Neutrons, Protons, S waves, Spectra, Two-body problem.

For abstract, see NSA 29 12, number 30697.

TLU-24-73 PC$4.25/MF$1.45
Tandemacceleratorlaboratoriet, Uppsala (Sweden).
D(P,2P)N CROSS SECTIONS FOR T/SUB P/ = 10.00 MEV.
B. Sundqvist, A. Johansson, L. Amten, L. Glantz, and L. Goenczi. Dec 73, 21p

Descriptors: (*Deuterium, Proton reactions), (*Proton reactions, *Breakup reactions), Correlations, Differential cross sections, Mev range 01-10, Neutrons, Protons, Van de graaff accelerators.

For abstract, see NSA 29 12, number 30698.

UCID-16372 PC$5.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
CALCULATIONAL MODELS FOR LLL PULSED SPHERES. CSEWG SHIELDING BENCHMARK COLLECTION NO. SDT 10.
E. F. Plechaty, and R. J. Howerton. Oct 73, 48p
Contract W-7405-eng-48

Descriptors: (*Spheres, *Neutron transport), (*Uranium 235, Neutron transport), (*Uranium 238, Neutron transport), (*Plutonium 239, Neutron transport), Fast neutrons, Mev range 10-100, Monte carlo method, Neutron spectra, Pulsed neutron techniques, Efficiency, Mev range 01-10, Neutron detection, Plastic scintillation detectors, Solid scintillation detectors, Angular distribution, Deuterium, Deuteron reactions, Helium 3, Kev range 100-1000, Neutrons, One-nucleon transfer reactions, Stripping.

For abstract, see NSA 29 12, number 30685.

20I. Plasma Physics

AD-780 033/7GA PC$3.25/MF$1.45
Princeton Univ., N.J. Plasma Physics Lab.
PLASMA MODIFICATION ASSOCIATED WITH PARAMETRIC INSTABILITIES DRIVEN BY INTENSE ELECTROMAGNETIC WAVES.
Final technical rept.,
James T. Flick, and Hans W. Hendel. Apr 74, 36p
RADC-TR-74-126
Contract F30602-73-C-0163, ARPA Order-1423

Descriptors: *Ionosphere, *Plasmas(Physics), *Electromagnetic radiation, Instability, Electron density, Ion density, Plasma devices, Modification.
Identifiers: Parametric instabilities, Ion acoustic waves, Q machines.

The purpose of the experimental effort is to study, in laboratory plasma, effects relating to observations of enhanced absorption of electromagnetic waves in the ionosphere. The experiments were performed in a Q-machine plasma, which has comparable ion and electron temperatures, similar to the ionosphere. The isothermal (T sub e about = (T sub i) parametric ion acoustic decay instability, expected to cause modification of the ionosphere upon irradiation by intense electromagnetic waves (omega sub 0) < or = (omega sub pe), has been studied in detail in laboratory Q-machine plasmas. The instability is conclusively identified by wavelength and frequency measurements, over all parameters determined ranges (k (lambda sub de) < or = 0.2; (omega sub LF)/(omega sub pi) < or = 1). Other parameters determined are instability threshold and maximum acoustic frequency dependence upon density; instability bandwidths and spatial profiles; electron and ion heating--all in agreement with linear, homogeneous theory. Not in agreement with theory are relations between LF, HF and pump intensities. (Modified author abstract)

AD-780 130/1GA Not available NTIS
Deutsche Forschungs-Und Versuchsanstalt Fuer Luft-Und Raumfahrt E V Porz-Wahn (West Germany)
MPD-RINGKANALSTROEMUNGEN IN GEKREUZTEN FREMDFELDERN FUER WILLKUERLICHE HALL-PARAMETER (MPD ANNULAR DUCT FLOW IN A CROSSED-FIELD DEVICE FOR ARBITRARY VALUES OF THE HALL PARAMETER),
K. Robert. 19 Mar 73, 8p Rept no. DFVLR-Sonderdruck-313
Text in German; summary in English.
Availability: Pub. in Zeitschrift fuer Naturforschung, v28a n7 p1108-1113 1973.

Descriptors: *Magnetohydrodynamics, *Crossed field devices, West Germany.

The steady, supersonic, barotropic, and inviscid flow of a rarefied gas plasma through an axisymmetric crossed-field device (imposed axial electric field and radial magnetic induction) is being analyzed, for arbitrary values of the Hall parameter. A previously developed perturbation method is used to obtain closed form solutions for the electric current density, flow velocity, and mass density within the annular duct. Conditions for optimal values of the Hall parameter are given. (Author)

AD-780 339/8GA PC$3.75/MF$1.45
Defence Research Establishment Valcartier Quebec
BEHAVIOR OF TURBULENT SCALES IN HYPERSONIC SPHERE WAKES,
L. Sevigny, and D. Heckman. Nov 73, 58p Rept no. DREV-R-696/73
Contract DAAH01-69-C-0921, ARPA Order-133
Summary in French.

Descriptors: *Projectiles, *Hypersonic flow, *Wake, Plasma sheaths, Electron density, Ion density, Langmuir probes, Turbulence, Canada.

The behavior of macroscales associated with the charge density fluctuations in the turbulent wakes of hypersonic spheres has been investigated using both Langmuir electron probes and continuum electrostatic ion probes. When cylindrical Langmuir probes are operated under favourable conditions, theoretical analysis indicates that the statistics of the probe current fluctuations are representative of the statistics of the electron density fluctuations. Similar analysis for continuum ion probes indicates however that the statistics of the current fluctuations depend not only on the ion density fluctuations but are possibly also strongly influenced by correlation functions involving temperature or velocity fluctuations. (Modified author abstract)

AD-780 359/6GA PC$5.50/MF$1.45
Innsbruck Univ (Austria) Inst for Theoretical Physics
17 YEARS PLASMA PHYSICS IN INNSBRUCK.
Bibliography 1957-1973,
Ferdinand Cap. 15 Sep 73, 47p Rept no. UNICP-SR-100

Descriptors: *Plasmas(Physics), *Magnetohydrodynamics, *Austria, *Bibliographies, Shock waves, Instability.

In the report the results of 17 years (1957 - 1973) of research in Magnetohydrodynamics and Plasma Physics are summarized and reviewed. It also covers a summary lecture held by F. Cap in Julich, Germany, Plasma Physics Institute of the Kernforschungsanlage Julich on 14 September 1973. The following topics are discussed: MHD - theory of ideal plasma; MHD - theory of a finite conductive plasma; MHD - channel flow and accelerators; MHD - waves, shocks, characteristics; MHD - instabilities; mathematical methods; Vlasov - plasmas and echoes; microinstabilities; experimental plasma physics; space plasmas.

AD-780 368/7GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
INFRARED DIAGNOSTICS AND LASER-INTERFEROMETRIC METHODS IN THE GAS DYNAMICS OF HIGH TEMPERATURES,
R. E. Soloukhin, and Yu. A. Yakobi. 24 May 74, 16p Rept no. FTD-HT-23-941-74
Edited trans. of Aerophysical Studies (Collection of scientific Papers) Inst. of Theoretical and Applied Mechanics Siberian Dept: USSR Academy of Sciences, Novosibirsk, 1972 p27-32 (sic), by Paul J. Reiff.

Descriptors: *Plasmas(Physics), *Gas dynamics, Translations, USSR.
Identifiers: Laser interferometry, Plasma diagnostics.

AD-780 510/4GA PC$3.25/MF$1.45
Air Force Cambridge Research Labs L G Hanscom Field Mass
DESIGN AND TESTING OF A CHEMICAL INJECTION SYSTEM FOR REENTRY PLASMA ALLEVIATION.
Physical sciences research papers,
John F. Lennon, and Sheldon B. Herskovitz. 28 Feb 74, 48p Rept nos. AFCRL-PSRP-588, AFCRL-TR-74-0113

Descriptors: *Plasma sheaths, *Atmosphere entry, *Blackout(Propagation), Fluorohydrocarbons, Injection, Electron density, Electrostatic probes, Flight testing.
Identifiers: Electrophilic reactions, Trailblazer, Ethane/Dibromo-tetrafluoro.

The effect of injecting an electrophilic liquid into the ionized flow field surrounding a reentry vehicle was observed during the flight of a trailblazer 2 on 28 July 1972. The report describes the rationale used to initially screen candidate additives and the experimental evaluation that finally resulted in the selection of Freon 114B2 for operational use. Injection system design and preliminary testing are discussed, and the predicted and actual performance during flight are compared. Data from on-board antennas and electrostatic probes confirmed that the additive reduced the electron density and improved transmission. A number of factors characterizing the injection are presented as a basis for analyzing the flow-additive interaction. (Author)

CONF-740316-3 PC$3.75/MF$1.45
Argonne National Lab., Ill. (Usa).
PROPERTIES OF RF-CONFINED PLASMAS.
A. J. Hatch. 1974, 33p

Descriptors: (*Plasma, *Confinement), Cavity resonators, Electron-atom collisions, Luminosity, Quadrupolar configurations, Radiowave radiation.

For abstract, see NSA 29 12, number 30905.

IPP-1-140 PC$5.00/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
ANALYTIC STUDY OF MHD EQUILIBRIA OF THE BELT PINCH IN "BELT-PINCH COORDINATES".
G. Becker. Jan 74, 39p

Descriptors: (*Equilibrium plasma, *Analytical solution), (*Belt pinch, Equilibrium plasma), Magnetohydrodynamics, Toroidal theta pinch devices.

For abstract, see NSA 29 12, number 30948.

IPP-1-141 PC$5.75/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
INVESTIGATION OF FAST MAGNETIC COMPRESSION AS METHOD FOR GENERATING A HOT WEAKLY COMPRESSED PLASMA.
F. Soeldner. Jan 74, 55p
In German.

Descriptors: (*Plasma heating, *Adiabatic compression heating), Electron density, Electron temperature, Hot plasma, Magnetic compression, Ruby, Theta pinch.

For abstract, see NSA 29 12, number 30906.

IPP-2-217 PC$4.00/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
RATE COEFFICIENTS FOR INTERACTION OF MONOENERGETIC PARTICLE BEAMS WITH MAXWELLIAN PLASMAS.
S. Rehker, and E. Speth. Jan 74, 17p

Descriptors: (*Collisional plasma, *Electron-atom collisions), Atomic beams, Boltzmann statistics, Charge exchange, Hydrogen, Interactions, Ion-atom collisions, Ionization.

For abstract, see NSA 29 12, number 30930.

IPP-2-219 PC$4.25/MF$1.45
Max-Planck-Institut fuer Plasmaphysik, Garching/Muenchen (F.R. Germany).
"RESI" A FIRST STAGE OF AN ONLINE DATA ACQUISITION AND ANALYSIS SYSTEM FOR LOW- BETA EXPERIMENTS.
S. Rehker, and D. Zimmermann. Jan 74, 24p IPP-4-115

Descriptors: (*Thermonuclear devices, *On-line measurement systems), (*Plasma diagnostics, On-line measurement systems), Computer codes, Data acquisition systems, Low-beta plasma.

For abstract, see NSA 29 12, number 30916.

UCID-16164(Rev.1) PC$4.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
INITIAL HEATING RATE OF A DROPLET IN A SPHERICAL MICROWAVE CAVITY.
E. Garelis. Feb 74, 26p
Contract W-7405-eng-48

Descriptors: (*Plasma heating, *High-frequency heating), (*Microwave radiation, Plasma heating), Cavity resonators, Fuel pellets, Spherical configuration.

For abstract, see NSA 29 12, number 30907.

20J. Quantum Theory

AD-780 195/4GA PC$4.00/MF$1.45
Perception Technology Corp Winchester Mass
USE OF SYMBOLIC MANIPULATION TECHNIQUES TO EXAMINE GRAVITATIONAL AND UNIFIED FIELD THEORIES.
Final technical rept. 30 Jun 73-15 Jun 74,
Huseyin Yilmaz, and Richard Pavelle. 15 Jun 74, 89p
Contract DAHC15-73-C-0369, ARPA Order-2465
See also AD-770 160.

Descriptors: *Relativity theory, *Field theory, *Gravity, Partial differential equations, Tensor analysis, Maxwells equations, Equations of motion, Scientific research.
Identifiers: Gravitational fields, General relativity, Lorentz transformations.

Contents:
Verification of the field equations;
Equations of motion and conservation laws;
Skew-symmetric phi sub mu nu and unified field theory;
New capabilities of MACSYMA, the tensor package.

AD-780 358/8GA Reprint
Rochester Univ N Y Dept of Physics and Astronomy
STATISTICAL MECHANICS FOR VELOCITY DEPENDENT INTERACTIONS.
Interim rept.,
M. D. Srinivas, and Y. S. Prahalad. 8 Aug 73, 5p AFOSR-TR-74-0881
Grant AF-AFOSR-2150-72
Revision of report dated 30 Mar 73. Prepared in cooperation with Matscience, Inst. of Mathematical Science, Madras (India).
Availability: Pub. in Jnl. of Mathematical Physics, v15 n1 p67-69 Jan 74.

Descriptors: *Quantum theory, *Statistical mechanics, Thermodynamics, Distribution functions, Partial differential equations.

The quantum corrections to the phase space distribution function was obtained for general velocity dependent interactions. It is noted that a study of the thermodynamic properties of bulk nuclear matter may settle the question of velocity dependence of nucleon-nucleon interaction. (Author)

AD-780 385/1GA Reprint
New York Univ N Y Courant Inst of Mathematical Sciences
KINETIC EQUATIONS FOR THE QUANTIZED MOTION OF A PARTICLE IN A RANDOMLY PERTURBED POTENTIAL FIELD.
Interim rept.,
Ioannis M. Besieris, and Frederick D. Tappert. 6 Sep 73, 11p AFOSR-TR-74-0853
Grant AF-AFOSR-2107-71
Availability: Pub. in Jnl. of Mathematics and Physics, v14 n12 p1829-1836 Dec 73.

Descriptors: *Quantum theory, *Particle trajectories, Schrodinger equation, Kinetic theory, Stochastic processes, Distribution functions.
Identifiers: Laplace equation, Liouville equation.

Within the framework of the first-order smoothing approximation and the long-time, Markovian ap-

proximation, kinetic equations are derived for the stochastic Wigner equation (the exact equation of evolution of the phase-space Wigner distribution function) and the stochastic Liouville equation (correspondence limit approximation) associated with the quantized motion of a particle described by a stochastic Schrodinger equation. (Modified author abstract)

AD-780 386/9GA Reprint
Rockefeller Univ New York Dept of Physics
A DISCRETE VERSION OF THE INVERSE SCATTERING PROBLEM,
K. M. Case, and M. Kac. 8 Nov 72, 12p AFOSR-TR-74-0857
Grant AF-AFOSR-2187-72
Availability: Pub. in Jnl. of Mathematical Physics, v14 n5 p594-603 May 73.

Descriptors: *Quantum theory, Schrodinger equation.
Identifiers: *Inverse scattering.

A discrete version of the inverse scattering problem is considered. The Schrodinger equation with a potential is replaced by a difference equation. The problem is to determine the coefficients given the phase shift. The motivation for the principal steps becomes obvious and the mathematics is elementary. At any stage one can pass, by a limiting procedure, to the usual Schrodinger problem - and reobtain the classical results. (Author)

AD-780 389/3GA Reprint
International Centre for Theoretical Physics Trieste (Italy)
CONFORMALLY INVARIANT MASSIVE SPINOR EQUATIONS. I.
Interim rept.,
A. O. Barut, and R. B. Haugen. 14 Mar 73, 18p AFOSR-TR-74-0876
Grant AF-AFOSR-2289-72
See also report dated 29 May 73, AD-380 390.
Availability: Pub. in Jnl. of Il Nuovo Cimento, v18A n3 p495-510, 1 Dec 73.

Descriptors: *Relativity theory, *Lorentz force, Conformal mapping, Invariance, Transformations(Mathematics), Tensor analysis.
Identifiers: Spinors, Minkowski space.

The formulation of the manifest conformally invariant spinor equations with mass term in the six-dimensional space is presented. The six-dimensional space is taken to be the physical space, the additional co-ordinates indicating the scale and scale changes. The minimal dimension of the spin space where a six-vector exists is eight. The geometry of the spin space, affine and spin connections are discussed and the general spinor equation is established. (Author)

AD-780 390/1GA Reprint
International Centre for Theoretical Physics Trieste (Italy)
CONFORMALLY INVARIANT MASSIVE AND MASSLESS SPINOR EQUATIONS. II. SOLUTIONS OF THE WAVE EQUATIONS.
Interim rept.,
A. O. Barut, and R. B. Haugen. 29 May 73, 23p AFOSR-TR-74-0877
Grant AF-AFOSR-2289-72
See also report dated 14 Mar 73, AD-780 389.
Availability: Pub. in Jnl. of Il Nuovo Cimento, v18 n3 p511-531 Dec 73.

Descriptors: *Relativity theory, *Leptons, *Wave equations, Quantum theory, Invariance, Conformal mapping, Transformations(Mathematics), Tensor analysis, Italy.
Identifiers: Spinors, Minkowski space.

The simplest possible conformal invariant spinor equations account completely for the known lepton states and their quantum numbers. In the massive case, the authors get a system with eight states: four satisfy the Dirac equation, when reduced to the Minkowski space, the other four are unstable leptons with apparent maximal parity, violating interaction terms although the original conformal invariant equations conserve parity. For the massless ease, the authors obtain the corresponding eight two-component spinors.

COO-2271-20 PC$8.00/MF$1.45
Columbia Univ., New York (Usa).
VACUUM STABILITY AND VACUUM EXCITATION IN A SPIN 0 FIELD THEORY.
T. D. Lee, and G. C. Wick. 1974, 97p

Descriptors: (*Quantum field theory, Vacuum states), (*Vacuum states, *Excitation), (*Trans 104 elements, *Stability), Expectation value, Goldstone bosons, Hermitian operators, Mass, Metastable states, Multiplicity, Nuclear theory, Nucleons, Sigma model, Sigma-410 resonances.

For abstract, see NSA 29 12, number 31097.

DESY-73-62 PC$4.25/MF$1.45
Deutsches Elektronen-Synchrotron (Desy), Hamburg (F.R. Germany).
PRODUCT STATES FOR LOCAL ALGEBRAS.
D. Buchholz. Dec 73, 24p

Descriptors: (*Scalar fields, *Algebra), Energy levels, Mass, Mathematical space, Space-time.

For abstract, see NSA 29 12, number 31098.

INP-855 PC$4.25/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
MULTIPLICATION LAW IN QUANTUM PHYSICS. PART I. THE NON-RELATIVISTIC QUANTUM MECHANICS.
E. Kapuscik. Nov 73, 24p

Descriptors: (*Quantum mechanics, *Heisenberg picture).

For abstract, see NSA 29 12, number 31082.

ITF-73-155-P PC$4.75/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
CLEBSCH--GORDAN COEFFICIENTS FOR THE DIRECT PRODUCT (M/SUB N/) X (1) OF THE GROUP SO(N) REPRESENTATIONS.
A. M. Gavrilik. 1973, 33p
In Russian.

Descriptors: (*So groups, *Clebsch-gordan coefficients), Algebra, Mathematical operators, Matrix elements, Vectors.

For abstract, see NSA 29 12, number 31083.

JINR-E2-7684 PC$4.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
THEORY OF DYNAMICAL AFFINE AND CONFORMAL SYMMETRIES AS GRAVITY THEORY.
A. B. Borisov, and V. I. Ogievetsky. 1974, 24p

Descriptors: (*Elementary particles, Gravitation), (*Gravitation, *Conformal groups), Einstein field equations, Field theories, Nonlinear problems, Poincare groups, Stability, Symmetry, Symmetry breaking, Tensors.

For abstract, see NSA 29 12, number 31124.

JINR-P2-7585 PC$4.00/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
STATEMENT OF A SCATTERING PROBLEM IN THE BOSON QUANTUM FIELD THEORY SUITABLE IN THE PRESENCE OF BOUND STATES.
L. G. Zastavenko. 1973, 20p
In Russian.

Descriptors: (*Quantum field theory, *Scattering), Bosons, Bound state, Boundary conditions, Quantum mechanics, S matrix.

For abstract, see NSA 29 12, number 31099.

JINR-P2-7605 PC$4.25/MF$1.45
Joint Inst. For Nuclear Research, Dubna (Ussr). Lab. Of Theoretical Physics.
UNPREDICTED PROPERTIES OF DEGENERATION OF THE VACUUM OF A SCALAR CHARGED FIELD INTERACTING WITH AN ELECTROMAGNETIC ONE FOR THE CASE OF ONE SPACE AND ONE TIME DEGREE OF FREEDOM.
L. G. Zastavenko. 1973, 24p
In Russian.

Descriptors: (*Scalar fields, *Interactions), Electromagnetic fields, Lagrangian function, Mass, Mathematical space, Rest mass, Time dependence.

For abstract, see NSA 29 12, number 31100.

NP-19895 PC$3.75/MF$1.45
Catania Univ. (Italy). Istituto di Fisica Teorica.
ASTROPHYSICS AND TACHYONS.
R. Mignani, and E. Recami. Oct 73, 32p

Descriptors: (*Gravitational fields, *Tachyons), (*Gravitational radiation, *Cherenkov radiation), Antimatter, Coordinates, Doppler effect, Geometry, Gravitation, Radiowave radiation, Relativity theory, Velocity.

For abstract, see NSA 29 12, number 31101.

NP-19899 PC$10.75/MF$1.45
Catania Univ. (Italy). Istituto di Fisica Teorica.
CLASSICAL THEORY OF TACHYONS (SPECIAL RELATIVITY EXTENDED TO SUPERLUMINAL FRAMES AND OBJECTS).
R. Mignani, and E. Recami. Jul 73, 175p

Descriptors: (*Magnetic monopoles, *Tachyons), Causality, Coordinates, Crossing symmetry, Relativity theory, Reviews, Scattering, Symmetry.

For abstract, see NSA 29 12, number 31102.

ORO-3992-154 PC$4.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
S-MATRIX FOR FINITE QUANTUM FIELD THEORY IN THE INTERACTIONS REPRESENTATION.
C. C. Chiang. 1973, 15p CPT-199
Contract AT(40-1)-3992

Descriptors: (*Quantum field theory, *S matrix), Heisenberg picture, Interactions, Metrics, Perturbation theory, Unitarity.

For abstract, see NSA 29 12, number 31103.

ORO-3992-161 PC$5.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
RIGGED HILBERT SPACE AND QUANTUM MECHANICS.
A. Bohm. 1974, 38p CPT-205
Contract AT(40-1)-3992

Descriptors: Harmonic oscillators, Hilbert space, Quantum mechanics.

For abstract, see NSA 29 12, number 31084.

ORO-3992-175 PC$4.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.

SCALING AND ASYMPTOTICALLY FREE MASSIVE YANG,-MILLS FIELD.
11 Apr 74, 5p CPT-219

Descriptors: (*Yang-mills theory, *Scale invariance), Boundary conditions, Lagrangian field theory, Mass, Renormalization.

For abstract, see NSA 29 12, number 31104.

ORO-3992-177 PC$4.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
GENERALIZED GAUGE INVARIANCE AND THE ASYMPTOTICALLY FREE THEORY OF MASSIVE YANG--MILLS FIELD.
J. P. Hsu. 1974, 14p CPT-221

Descriptors: (*Yang-mills theory, *Gauge invariance), Boundary conditions, Coupling, Feynman diagram, Mass, Renormalization, S matrix, Symmetry, Unitarity, Vector fields.

For abstract, see NSA 29 12, number 31105.

ORO-3992-178 PC$4.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
DETERMINATION OF THE RELATIVISTIC WAVE EQUATIONS ASSOCIATED WITH A GIVEN REPRESENTATION OF SL(2,C).
W. J. Hurley, and E. C. G. Sudarshan. 1974, 14p CPT-222
Contract AT(40-1)-3992

Descriptors: (*Sl groups, *Wave functions), (*Elementary particles, Wave functions), Algebra, Group theory, Hermitian matrix, Interactions, Mass, Parity, Rarita-schwinger theory, Relativistic range, Singularity, Spin.

For abstract, see NSA 29 12, number 31085.

ORO-3992-179 PC$4.00/MF$1.45
Texas Univ., Austin (Usa). Center for Particle Theory.
FASTER THAN LIGHT PARTICLES AND T-VIOLATION.
R. Vilela Mendes. Dec 73, 13p CPT-223

Descriptors: (*Tachyons, *Interactions), (*T invariance, Tachyons), Causality, Cp invariance, Field theories, Matter.

For abstract, see NSA 29 12, number 31106.

20K. Solid Mechanics

AD-779 831/7GA PC$3.25/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STATISTICAL PROBLEMS OF VIBRATION AND BUCKLING STRENGTH IN ELASTIC SYSTEMS (CHAPTER 10),
V. V. Bolotin, and M. F. Dimentberg. 3 May 74, 47p Rept no. FTD-HC-23-1004-74
Edited trans. of Prochnost i Ustoichivost-Kolebaniya (USSR) v3 p513-546 1968.

Descriptors: *Vibration, *Buckling, *Statistical analysis, Elastic properties, Translations, USSR.

AD-780 244/0GA PC$4.25/MF$1.45
Columbia Univ New York Dept of Civil Engineering and Engineering Mechanics
ELECTROMAGNETIC RADIATION FROM A VIBRATING ELASTIC SPHERE.
Technical rept.,
R. D. Mindlin. Jan 74, 21p Rept no. TR-28
Contract N00014-67-A-0108-0027

Descriptors: *Dielectrics, *Vibration, *Electromagnetic radiation, Boundary value problems, Equations of motion, Sodium chloride, Mechanical properties, Electrical properties.

When the contribution of the polarization gradient to the stored energy is taken into account, in the theory of elastic dielectrics, there is a small coupling between electromagnetic and elastic energies even in isotropic materials. It is found that the electromagnetic radiation from an isotropic, elastic, dielectric sphere vibrating in its fundamental rotatory mode, with a maximum shear strain of 0.001, is of the order of 10 to the minus 38th power watts - independent of the radius of the sphere and proportional to the square of the strain. (Author)

AD-780 267/1GA PC$4.25/MF$1.45
Chesapeake Instrument Corp Shady Side Md
AXIAL AND RADIAL VIBRATIONS OF A LIQUID-FILLED CYLINDRICAL SHELL SUBMERGED IN A HEAVY FLUID,
Michael E. McCormick. 4 Aug 69, 22p Rept no. CIC-69R-002
Contract N00014-69-C-0165

Descriptors: *Shells(Structural forms), Cylindrical bodies, Vibration, Resonant frequency, Equations of motion, Compression, Fluids.
Identifiers: *Cylindrical shells.

The variational method is used to determine the natural frequencies of a cylindrical shell containing a compressible fluid and submerged in another compressible fluid. Results of the analysis show that for thick shells, the mass densities of the fluids significantly affect the natural frequencies. The internal pressure influences the frequencies of thin shells but has little or not effect on thick shells. The length of the shell is found to be the most effective frequency control parameter. (Author)

AD-780 268/9GA PC$4.00/MF$1.45
Chesapeake Instrument Corp Shady Side Md
AXISYMMETRIC VIBRATIONS OF A PRESSURIZED CYLINDRICAL SHELL SUBJECT TO RANDOM EDGE LOADING,
Michael E. McCormick. 4 Aug 69, 13p Rept no. CIC-69R-005
Contract N00014-69-C-0165

Descriptors: *Shells(Structural forms), Cylindrical bodies, Vibration, Loads(Forces), Damping, White noise, Excitation, Pressure.
Identifiers: *Cylindrical shells.

A theoretical analysis is presented of the damped axisymmetric motions of a pressurized cylindrical shell excited by a random axial load. For the special case of a white-noise excitation, the autocorrelation of the respective axial and radial responses of the shell is found to be an exponentially decaying sinusoid. (Author)

AD-780 362/0GA PC$4.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
STABILITY OF SHELLS. CHAPTER 3,
A. S. Volmir, and I. G. Kildibekov. 23 Apr 74, 130p Rept no. FTD-HC-23-999-74
Edited trans. of Prochnost i Ustoichivost-Kolebaniya (USSR) v3 p127-215 1968.

Descriptors: *Elastic shells, Stability, Loads(Forces), Deflection, Buckling, Translations, USSR.

AD-780 363/8GA PC$3.75/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
VIBRATIONS OF PLATES. CHAPTER 7,
V. V. Bolotin, and V. N. Moskalenko. 22 Apr 74, 58p Rept no. FTD-HC-23-1001-74
Edited trans. of Prochnost i Ustoichivost Kolebaniya (USSR) v3 p370-417 1968.

Descriptors: *Vibration, *Plates, Partial differential equations, Stresses, Numerical analysis, Translations, USSR.
Identifiers: Laplace equation.

AD-780 498/2GA PC$6.75/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
GALERKIN'S APPROXIMATION TO MINIMUM WEIGHT STRUCTURES WITH DYNAMIC CONSTRAINTS.
Master's thesis,
Gerald M. Van Keuren, Jr. Mar 74, 71p Rept no. GAW/MC/74-18

Descriptors: *Structural members, *Aircraft, *Flutter, *Vibration, Partial differential equations, Matrices(Mathematics), Numerical analysis, Theses.
Identifiers: *Galerkin method, Structural design.

Galerkin's method is applied to the design of minimum weight structures with dynamic constraints. The problems considered include the weight optimization of a simply supported beam and a panel, with the condition that their fundamental frequencies be the same as those of corresponding uniform thickness structures. Galerkin's method is also used for the weight optimization of a semi-infinite panel and of a finite square panel, both of which have flutter speed constraints. In addition, the assumption of a symmetric thickness distribution in the flutter problems is investigated. (Modified author abstract)

AD-780 499/0GA PC$7.25/MF$1.45
Air Force Inst of Tech Wright-Patterson AFB Ohio School of Engineering
ESTIMATIONS OF THE EFFECT OF DESIGN CHANGES ON THE MODES AND FREQUENCIES OF VIBRATING STRUCTURAL ELEMENTS.
Master's thesis,
Edward G. Taylor. Mar 74, 82p Rept no. GAW/MC/74-17

Descriptors: *Structural members, *Vibration, *Aerodynamic configurations, Flutter, Buckling, Boundary value problems, Partial differential equations, Computations, Theses.
Identifiers: *Structural design, Revisions, Finite element analysis, Rayleigh-Ritz method, Eigenvalues.

As the state description of a structural system changes, the eigenvalues and eigenfunctions may also change. The paper derives expressions for the rates of change of these characteristic quantities for continuous systems. These derivatives can be used in a Taylor series to predict values for perturbed designs. Normally a series of approximation is valid within some narrow neighborhood of the initial or known state. An iterative technique is developed which reduces this restriction. The field of structural optimization has achieved greater importance as more is demanded of designs. Least mass solutions are obtained for the sandwich and solid rectangular beams. The problem of optimizing an Euler column is also examined. (Modified author abstract)

20L. Solid-State Physics

AD-779 801/0GA PC$4.00/MF$1.45
International Business Machines Corp Hopewell Junction N Y East Fishkill Lab
CRYSTAL PROPERTIES AS INFLUENCED BY CRYSTALLOGRAPHIC IMPERFECTION (CADMIUM TELLURIDE).
Rept. for 1 Apr 72-30 Jun 73,
Guenter H. Schwuttke. 1 Nov 73, 83p Rept no. Scientific-1 AFCRL-TR-74-0061
Contract F19628-72-C-0274

Descriptors: *Cadmium tellurides, Surfaces, Polishes, Zinc selenides, Crystal structure, Defects(Materials), Electron microscopy.
Identifiers: X ray topography, Lattice parameters.

The report consists of two parts. Part 1 reports a chemical-mechanical approach for generating damage-free and highly specular surfaces on single crystal and polycrystalline cadmium telluride and

zinc selenide. The polishing agent is a clear solution of potassium bromide, sodium hypochlorite, sodium carbonate and water. Polishing is achieved by forming a reaction product on the primary surface, removing the reaction product, and exposing a new and fresh primary surface for continuing chemical action. Large perfect surfaces are thus obtained. Part 2 is concerned with the application of transmission electron microscopy, x-ray topography, and precision lattice parameter measurements to the characterization of cadmium telluride. New specimen preparation techniques were developed making the application of such techniques to the characterization of cadmium telluride possible. The defect structure of cadmium telluride crystals is resolved. Major defects are dislocation and tellurium inclusions. Measurement of lattice parameter, x-ray density, and thermal coefficient of expansion of CdTe are reported. (Author)

AD-779 823/4GA PC$4.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
SOLID STATE RESEARCH, 1974:1.
Quarterly technical summary 1 Nov 73-31 Jan 74,
Alan L. McWhorter. 15 Feb 74, 88p ESD-TR-74-38
Contract F19628-73-C-0002
See also AD-778 086.

Descriptors: *Solid state electronics, *Solid state physics, *Semiconductor lasers, *Microelectronics, *Quantum electronics, Scientific research, Photodiodes, Light emitting diodes, Laser materials, Carbon monoxide lasers, Indium antimonides, Infrared lasers, Aluminum.

The report covers in detail the solid state research work of the Solid State Division at Lincoln Laboratory for the period 1 November 1973 through 31 January 1974. The topics covered are Solid State Device Research, Quantum Electronics, Materials Research, Physics of Solids, and Microelectronics. The Microsound work is sponsored by ABMDA and is reported under that program. (Author)

AD-779 855/6GA PC$3.25/MF$1.45
California Univ Berkeley Dept of Mechanical Engineering
RESTRICTIONS ON CONSTITUTIVE EQUATIONS OF FINITELY DEFORMED ELASTIC-PLASTIC MATERIALS.
Technical rept.,
P. M. Naghdi, and J. A. Trapp. Apr 74, 38p Rept no. AM-74-2
Contract N00014-69-A-0200-1008

Descriptors: *Deformation, *Elastic properties, *Plastic properties, Numerical analysis, Strain rate.

The paper is concerned with restrictions on the constitutive equations of elastic-plastic materials in the presence of large deformation. The development is confined to the purely mechanical theory in which the response of the medium is characterized by nonlinear constitutive equations of rate-type. Starting with a physically plausible assumption concerning non-negative work in a closed cycle of deformation, tha authors derive two local inequalities which hold in all motions and which place restrictions on the general constitutive equations of elastic-plastic materials. An implication of one of the inequalities is then used to express the constitutive equation for the plastic strain rate in terms of the yield (or loading) function, as well as the stress response and a measure of work hardening. (Author)

AD-779 858/0GA PC$3.00/MF$1.45
Naval Ordnance Lab White Oak Md
HIGH-FIELD MAGNETIZATION AND COERCIVITY OF AMORPHOUS RARE-EARTH-FE2 ALLOYS.
Technical rept.,
Arthur E. Clark. 11 Jul 73, 17p Rept no. NOLTR-74-47

Descriptors: *Magnetic materials, *Rare earth compounds, *Iron alloys, Amorphous materials, Terbium compounds, Dysprosium compounds, Samarium compounds, Magnetization, Coercive force, Magnetic moments.
Identifiers: Terbium intermetallics, Dysprosium intermetallics, Samarium intermetallics, Iron intermetallics.

High-field magnetization studies were made from 4K to room temperature on rapidly sputtered TbFe2, DyFe2, and SmFe2. At 4.2K the magnetic moment resembles that of polycrystal samples, whereas at room temperature it is substantially lower. Huge coercive forces (20-30 kOe) were observed at 4.2K. Partial crystallization of TbFe2 from the sputtered amorphous state yields high-energy products and coercivities (>3 kOe) at room temperature. (Author)

AD-779 869/7GA PC$3.00/MF$1.45
Illinois Univ Urbana Dept of Electrical Engineering
RESEARCH ON SEMICONDUCTORS AND TRANSISTOR ELECTRONICS.
Final rept. 16 Sep 67-15 Sep 73,
Paul Handler. May 74, 6p Rept no. UILU-ENG-74-2545
Contract N00014-67-A-0305-0011

Descriptors: *Solid state physics, *Solid state electronics, *Naval research, Semiconductors, Surface properties, Space charge, Band theory of solids, Germanium, Silicon, Gallium arsenides, Bibliographies.

The areas of research have been mainly surface physics of semiconductor surfaces. The original direction of the research was directed toward space charge layers and the role of surface states on oxide covered and atomically clean surfaces in vacuum. Later on interest and techniques changed so that the major field of interest was the band structure of germanium silicon and gallium arsenide using the space charge region modulation techniques developed by this laboratory and others over the past decade. The contribution to the field of solid state electronics during the period of ONR support under this contract as well as previous ones is shown by the list of publications which follows this page. The publication titles show the diversity of subjects covered as well as the names of the personnel who have worked on this contract.

AD-779 888/7GA PC$3.00/MF$1.45
Brown Univ Providence R I Div of Applied Mathematics
THE ENTROPY RATE ADMISSIBILITY CRITERION IN THERMOELASTICITY.
Interim rept.,
Constantine M. Dafermos. May 74, 15p
Contract N00014-67-A-0191-0009, Grant DA-ARO-D-31-124-73-G130
Sponsored in part by Grant NSF-GP-28931.

Descriptors: *Viscoelasticity, Entropy, Shock waves, Differential equations, Inequalities, Theorems.
Identifiers: *Thermoelasticity.

The initial value problem for the dynamical equations of elasticity and thermoelasticity is not well posed in the class of smooth motions so that an existence theory in the large can be established only for thermodynamic processes with shock waves. On the other hand, in this class of processes there is no uniqueness of solutions. It is shown in the report that, by visualizing a thermoelastic material as the limit of a family of thermoviscoelastic materials of the Maxwell type, one obtains a shock admissibility criterion, the viscosity criterion.

AD-779 893/7GA PC$3.00/MF$1.45
American Museum of Natural History New York Dept of Animal Behavior
AMPLIFICATION BY INJECTION LOCKING OF A JOSEPHSON OSCILLATOR.
Technical rept.,
Charles V. Stancampiano, and Sidney Shapiro.
Apr 74, 18p
Contract N00014-67-A-0398-0003

Descriptors: *Josephson junctions, Superconductivity, Microwave amplifiers, Microwave oscillators.
Identifiers: *Microwave detection.

Josephson oscillations near 9 GHz, produced by a point-contact junction mounted in a coaxial resonator and biased onto the cavity-induced step in its V-I curve, have been pulled in frequency and phase locked by a weak injected signal at a nearby frequency. The resulting output was at the signal frequency and had the narrow bandwidth and frequency stability of the input but the power level of the Josephson oscillations. Maximum gain of 51dB was achieved for an input of 10 to the minus 16th power W. (Author)

AD-779 983/4GA PC$3.00/MF$1.45
Cornell Univ Ithaca N Y Materials Science Center
SQUID TECHNIQUES. I. OBTAINING RELIABILITY IN POINT CONTACT SQUIDS.
Technical rept.,
R. A. Buhrman, J. E. Lukens, L. D. Jackel, S. F. Strait, and J. M. Warlaumont. 1 Jun 74, 12p Rept nos. MSC-2224, TR-17
Contract N00014-67-A-0077-0016

Descriptors: *Superconductors, *Reliability, Niobium, Signal to noise ratio.
Identifiers: SQUID(Superconducting QUantum Interference Devices), Superconducting quantum interference devices.

Stable and permanent niobium point contact SQUIDs have been fabricated by using oxidized niobium screws to form the point contact. The reliability of these devices is further ensured by a simple and versatile environmental shielding procedure. Over a period of five years there have been no failures of such SQUIDs in our laboratory. The signal-to-noise performance of these SQUIDs is quite good. (Author)

AD-779 921/6GA PC$3.25/MF$1.45
Rockwell International Corp Thousand Oaks Calif Science Center
II-VI AND III-V HETEROSTRUCTURES FOR OPTO-ELECTRONIC APPLICATIONS.
Final rept. 1 May-31 Oct 73,
T. C. Lim. Feb 74, 32p Rept no. SC552.7FR
AFML-TR-74-30
Contract F33615-73-C-5154

Descriptors: *Semiconducting films, *Epitaxial growth, Zinc sulfides, Zinc selenides, Indium phosphides, Arsenides, Doping, Electrooptics, Vapor deposition, Photodiodes.
Identifiers: Indium arsenides, Chemical vapor deposition, Heterojunctions.

The initial work of Yim and Stofko demonstrated that good quality epitaxial films of ZnS and ZnSe could be achieved by chemical vapor phase deposition (CVD). The purpose of this work is to conduct further exploratory research using CVD aimed at elucidating optimum growth and doping conditions with the goal of producing controlled dopant characteristics. Results on dopants such as Cu, Ga, and Al are presented. It is found that in order to achieve routinely a low resistivity (rho < one ohm-cm) of n-type ZnSe film, the gallium-to-zinc ratio has to be about 25%. Such a result has never been previously obtained in open-tube vapor-phase-epitaxy. These films were grown on highly-insulating ZnSe substrates, p+-GaAs, and p-GaAs substrates. Preliminary results on graded heterostructures of InAs(1-x)P(x) for lightemitting or detector applications are also discussed. (Modified author abstract)

AD-779 948/9GA PC$3.25/MF$1.45
Technion - Israel Inst of Tech Haifa Material Mechanics Lab
A REPRESENTATION OF ELASTIC-VISCOPLASTIC STRAIN-HARDENING BEHAVIOR FOR GENERALIZED STRAINING HISTORIES.
Interim rept.,
S. R. Bodner, and Y. Partom. Apr 74, 27p Rept nos. MED-45, Scientific-3 AFOSR-TR-74-0867
Grant AF-AFOSR-2607-74

Descriptors: *Elastic properties, *Viscoplastic properties, Strain rate, Equations, Strain hardening, Stress strain relations, Israel.

A theory of elastic-viscoplastic, strain-hardening material behavior has been developed which is motivated in part from concepts of 'dislocation dynamics'. The basis of the formulation is the separation of the total deformation rate into elastic (geometrically reversible) and inelastic (geometrically irreversible) components at all stages of loading and unloading. The constitutive equations are relations between the deformation rate components and state variables which, in the present stage of formulation, are the stress and the total plastic work which is introduced as the measure of strain-hardening. The same equations hold at all stages of deformation which makes the formulation suitable for computer solution of structural problems involving complicated loading histories. Some examples are given illustrating the application of the constitutive equations to variable straining histories and to structural problems. The description of the anelastic properties of materials by means of the general formulation is also discussed. (Author)

AD-780 118/6GA PC$7.50/MF$1.45
California Univ Los Angeles School of Engineering and Applied Science
CHARACTERIZATION OF SEMICONDUCTING GLASSES FOR USE AS BOLOCON LAYERS.
Final rept.,
J. D. Mackenzie. Apr 73, 90p Rept no. UCLA-ENG-7358
Contract DAAK02-72-C-0283

Descriptors: *Semiconductors, *Glass, Chalcogens, Fluorides, Oxides, Dielectric properties, Electrical conductivity, Tables(Data), Amorphous materials.
Identifiers: *Semiconducting glasses, Amorphous semiconductors.

The report evaluates all the factors governing the electronic conductivity, the activation energy for conduction, and the dielectric constant of glasses as well as their interdependence in order to assess the possibility of developing a glass with certain characteristics as outlined in the text. Because no theoretical treatments have been published which may be used as a guidance for the preparation of the glasses of the desired properties, theoretical studies and experimental preparation of new glasses were undertaken. Although both oxide and non-oxide glasses were measured, emphasis was ultimately placed on oxide glasses. Preliminary calculations of fluoride and chalcogenide glasses imply that these are able to exceed the oxide glasses. (Modified author abstract)

AD-780 344/8GA Reprint
Aerospace Research Labs Wright-Patterson AFB Ohio
HARTREE-FOCK LATTICE CONSTANT AND BULK MODULUS OF DIAMOND,
G. T. Surratt, R. N. Euwema, and D. L. Wilhite. 1973, 6p Rept no. ARL-74-0084
Availability: Pub. in International Jnl. of Quantum Chemistry Symposium n7 p607-611 1973.

Descriptors: *Diamonds, Hartree-Fock approximation, Least squares method, Energy, Crystal structure.
Identifiers: *Lattice parameters, *Bulk modulus.

The equilibrium lattice constant of diamond is calculated in the Hartree-Fock approximation to be 3.547 plus or minus 0.0019 A. This value is slightly smaller than the experimental value of 3.567 A, as it should be. The Hartree-Fock bulk modulus is calculated to be 4.64 plus or minus 0.27 x 10 to the 12th power dyn/sq cm, compared to the experimental value of 4.42 x 10 to the 12th power dyn/sq cm. (Author)

AD-780 403/2GA Reprint
California Univ Berkeley Electronics Research Lab
CARRIER MOBILITIES AT WEAKLY INVERTED SILICON SURFACES,
J. T. C. Chen, and R. S. Muller. 11 Jun 73, 10p
AFOSR-TR-74-0845
Contract F44620-71-C-0087
Revision of report dated 19 Nov 71.
Availability: Pub. in Jnl. of Applied Physics, v45 n2 p828-834 Feb 74.

Descriptors: *Silicon, *Semiconductors, Surface properties, Metal oxide semiconductors, Transistors.
Identifiers: *Carrier mobility.

A theory for carrier mobilities at weakly inverted Si surfaces is described. The theory treats transport of carriers across barriers in regions of statistically variable surface potentials. The potential variations are related to an earlier model proposed by Nicollian and Goetzberger to explain trapping phenomena. Measurements of surface conductance at inverted Si surfaces are presented which extend to lower free-carrier populations than previously reported work. (Modified author abstract)

AD-780 404/0GA Reprint
California Univ Berkeley Electronics Research Lab
SIMPLE CALCULATION OF ENERGY DISTRIBUTION OF LOW-ENERGY SECONDARY ELECTRONS EMITTED FROM METALS UNDER ELECTRON BOMBARDMENT,
M. S. Chung, and T. E. Everhart. 23 Apr 73, 5p
AFOSR-TR-74-0846
Contract F44620-71-C-0087
Availability: Pub. in Jnl. of Applied Physics, v45 n2 p707-709 Feb 74.

Descriptors: *Metals, *Electron irradiation, *Secondary emission, Electron energy, Work functions.

A simple theoretical calculation is given in which the energy distribution of low-energy secondary electrons emitted from metals is derived. The main feature of the calculation is an energy-dependent electron mean free path. The theory predicts that the peak of the energy distribution occurs at a value of the secondary electron energy equal to phi/3, where phi is the metal work function. (Author)

AD-780 431/3GA PC$5.25/MF$1.45
Naval Research Lab Washington D C
TRANSPORT THEORY FOR HEAVY ION BEAMS NEAR A TARGET SURFACE,
G. P. Mueller. 21 Jun 74, 43p

Descriptors: *Amorphous materials, *Ion bombardment, Elastic scattering, Inelastic scattering, Distribution functions, Boltzmann equation, Transport properties.

The method of Manning and Padgett (MP) for studying the transport of heavy ion beams in amorphous solids is modified to allow for inelastic (electronics) slowing of the ion beam as well as elastic scattering. The beam ion distribution function consists of three terms with the following characteristics: a C-term, which represents the beam as it first enters the target, wherein it looses energy to inelastic processes but retains its unidirectional character; a B-term, which represents beam ions which have undergone one elastic collision; and an A-term representing beam ions which have undergone two or more elastic collisions. In the present work the exact solutions of the C- and B-portions of the Boltzmann equation are given. An iterative method for solving for the A-term is presented. The results of numerical calculations are reported for a variety of beam ions and beam energies. (Modified author abstract)

AD-780 459/4GA PC$3.00/MF$1.45
California Univ Irvine Dept of Physics
INCOMPATIBILITY OF BCS PAIRING AND THE PEIERLS DISTORTION IN LINEAR CHAIN SYSTEMS.
Final rept.,
K. Levin, D. L. Mills, and S. L. Cunningham. Nov 73, 14p Rept no. TR-73-74
Contract N00014-69-A-0200-9003, Grant AF-AFOSR-2018-71

Descriptors: *Superconductors, Electron gas, Field theory, Hamiltonian, Phase transformations, Transition temperature, Superconductivity.
Identifiers: BCS theory, Peierls stress, Order parameters.

The authors have solved the coupled gap equations for a one-dimensional electron gas which can undergo both a Peierls insulating and a BCS superconducting transition. It is found that, except for a very special case, (1) only one of the order parameters can be non-vanishing and (2) there is only one critical temperature. It is concluded that, independent of the pairing interaction strength, if the Peierls transistion occurs, there can be no BCS superconductivity, and conversely. (Author)

AD-780 464/4GA PC$3.75/MF$1.45
California Univ Los Angeles Dept of Physics
UPPER CRITICAL FIELD AND CRITICAL TEMPERATURE FOR SUPERCONDUCTING ALLOYS DESCRIBED BY THE ANDERSON MODEL.
Technical rept.,
G. B. Arnold. Jan 74, 52p
Contract N00014-69-A-0200-4032
Sponsored in part by National Science Foundation, Washington, D.C.

Descriptors: *Superconductors, Hartree-Fock approximation, Superconductivity, Impurities, Mathematical models.
Identifiers: *Anderson model, *Critical field, *Critical temperature.

Extending some recent work by H. Shiba the authors have used the Hartree-Fock approximation for the Anderson Model of localized impurity electron states in a superconductor to obtain expressions for the critical temperature in zero magnetic field and for the upper critical field. The expression for the critical temperature reduces to Kaiser's result in the limit of no impurity magnetic moment, and Fulde and Maki's result in the magnetic limit. Between these two limits are found results which differ appreciably from those of either limit. (Author)

CALT-822-59 PC$5.00/MF$1.45
California Inst. Of Tech., Pasadena (Usa). W.M. Keck Lab. Of Engineering Materials.
SUPERCONDUCTIVITY IN METAL-SEMICONDUCTOR EUTECTIC ALLOYS. AEC RESEARCH AND DEVELOPMENT REPORT NO. 51.
C. C. Tsuei, and W. L. Johnson. Mar 74, 40p
Contract AT(04-3)-822

Descriptors: (*Aluminium alloys, *Superconductivity), (*Silicon alloys, Superconductivity), (*Germanium alloys, Superconductivity), Eutectics, Excitons, Semiconductor materials, Transition temperature.

For abstract, see NSA 29 12, number 30661.

CEA-CONF-2452 PC$3.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France).
PLOTTING OF DEPTH DISTRIBUTION OF IMPURITIES WITH THE CASTAING--SLODZIAN ION ANALYSER.
B. Blanchard, N. Hilleret, and J. B. Quoirin. 22 Aug 73, 20p CONF-730314-2
In French.

Descriptors: (*Boron ions, *Ion implantation), (*Arsenic ions, Ion implantation), (*Aluminium ions, Ion implantation), Depth, Diffusion, Distribution, Impurities, Ion probes, Nuclear reactions, Silicon, Silicon oxides, Standards.

For abstract, see NSA 29 12, number 31638.

CEA-CONF-2484 PC$4.00/MF$1.45
Cea Centre d'Etudes Nucleaires de Grenoble, 38 (France). Dept. De Recherche Fondamentale.
SYMMETRY LOWERING OF LATTICE DEFECTS DUE TO ANHARMONIC INTERATOMIC FORCES.
J. A. Sussmann. 1973, 7p CONF-730844-7

Descriptors: (*Metals, *Crystal defects), Atoms, Crystal lattices, Elasticity, Electronic structure, Interstitials, Irradiation, Lattice vibrations, Physical radiation effects.

For abstract, see NSA 29 12, number 31650.

CEA-R-4558 PC$9.50/MF$1.45
Cea Centre d'Etudes Nucleaires de Fontenay-aux-Roses, 92 (France).
ELASTORESISTIVITY OF POINT DEFECTS IN COPPER.
J. von Stebut. Dec 73, 148p
In French.

Descriptors: (*Copper, *Point defects), Electric conductivity, Impurities, Interstitials, Physical radiation effects, Plasticity, Polycrystals, Tensile properties, Vacancies, Young modulus.

For abstract, see NSA 29 12, number 31639.

COM-74-50506/6GA Not available NTIS
National Bureau of Standards, Washington, D.C.
PIEZO- AND PYROELECTRICITY IN POLYMER ELECTRETS.
Final rept.,
M. G. Broadhurst, C. G. Malmberg, F. I. Mopsik, and W. P. Harris. 1973, 13p
Contract NAonr-27-73
Pub. in Proceedings of Conference on Electrets, Charge Storage and Transport in Dielectrics, Miami Beach, Fla. 8-13 Oct 72. Chapter in Electrets, Charge Storage and Transport in Dielectrics, M. M. Perlman, Ed., p492-504 1973.

Descriptors: *Electrets, *Polymers, *Polyvinyl chloride, Polarity, Dipoles, Models, Piezoelectricity, Pyroelectricity, Strain rate.

A model for a polymer electret, based on an elastically isotropic solid with orientationally frozen molecular dipoles, was developed and tested experimentally. This electret is shown to be both piezoelectric and pyroelectric. The polarization is shown to change with mechanically and thermally induced strains in the polarization direction. The currents generated by the electret will be proportional to the strain rate and, for thin contact electrodes and uniform strains, unaffected by the presence of real charges. Poly(vinyl chloride) films were poled at 80C, just above their glass transition temperature.

COM-74-50509/0GA Not available NTIS
National Bureau of Standards, Washington, D.C.
REFRIGERATION WITH FORCED FLOW OF HELIUM.
Final rept.,
M. C. Jones, P. J. Giarratano, P. M. McConnell, and V. Arp. Dec 73, 22p
Pub. in Proceedings of Cryogenic Cooler Conference, USAF Academy, Colorado Springs, Colo., 16-17 Oct 73, p441-462.

Descriptors: *Refrigerating, *Cryogenics, Liquid helium, Heat transfer.

The operation of practical superconducting components usually generates some heat because of non-ideality of the superconductors, particularly in a. c. applications. In many cases, e. g., pulsed magnets, system design and performance is strongly constrained by the available heat transfer between the superconductor and the surrounding helium. The authors have been studying the general problems of maintaining the required refrigeration by forced flow of helium.

COM-74-50516/5GA Not available NTIS
National Bureau of Standards, Washington, D.C.
JOSEPHSON JUNCTIONS AT 45 TIMES THE ENERGY-GAP FREQUENCY.
Final rept.,
D. G. McDonald, F. R. Petersen, J. D. Cupp, B. L. Danielson, and E. G. Johnson. Apr 74, 3p
Pub. in Applied Physics Letters, v24 n7 p335-337, 1 Apr 74.

Descriptors: *Josephson junctions, Cryogenics, Superconductivity, Niobium.

Superconductive Nb-Nb point contracts have been studied with 9.5 micrometer radiation from CO2 lasers. Two models are considered to explain the experiments: one is Werthamer's Josephson junction model and the other is a thermally modulated Josephson junction. The evidence favors Werthamer's model but is not conclusive.

COO-3150-20 PC$4.00/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Lab. Of Atomic and Solid State Physics.
TESR MEASUREMENTS OF EXCHANGE, CRYSTAL FIELD, AND ENHANCEMENT PARAMETERS IN DILUTE AL:ER ALLOYS.
J. F. Siebert, S. A. Dodds, and R. H. Silsbee. Feb 74, 17p

Descriptors: (*Aluminium base alloys, *Electronic structure), Crystal field, Electron spin resonance, Erbium alloys, Exchange interactions, Transmission.

For abstract, see NSA 29 12, number 30078.

COO-3151-35 PC$4.00/MF$1.45
Cornell Univ., Ithaca, N.Y. (Usa). Lab. Of Atomic and Solid State Physics.
TUNABLE JOSEPHSON JUNCTION FAR INFRARED SOURCE. REPORT NO. 2151.
R. K. Elsley, and A. J. Sievers. Jan 74, 7p
Contract AT(11-1)-3151

Descriptors: (*Josephson junctions, *Far infrared radiation), Electric contacts, Niobium, Radiation sources, Spectroscopy.

For abstract, see NSA 29 12, number 30674.

COO-3460-5 PC$4.00/MF$1.45
Rensselaer Polytechnic Inst., Troy, N.Y. (Usa).
THERMAL COEFFICIENT OF EXPANSION OF AN ACTIVATED VACANCY IN METALS. FINAL REPORT.
L. C. Chhabildas. Jan 74, 8p
Contract AT(30-1)-3460

Descriptors: (*Vacancies, *Thermal expansion), Bibliographies, Metals, Research programs.

For abstract, see NSA 29 12, number 30079.

HEDL-TME-73-59 PC$4.00/MF$1.45
Hanford Engineering Development Lab., Richland, Wash. (Usa).
DISPLACEMENT CROSS SECTIONS FOR FE, CR, NI, 18/10 SS, MO, V, NB, AND TA.
D. G. Doran, and N. J. Graves. Jul 73, 34p
Contract AT(45-1)-2170

Descriptors: (*Iron, *Physical radiation effects), (*Chromium, Physical radiation effects), (*Nickel, Physical radiation effects), (*Tantalum, Physical radiation effects), Fast neutrons, Kev range, Mev range, Molybdenum, Neutron reactions, Niobium, Stainless steels, Vanadium.

For abstract, see NSA 29 12, number 31043.

INP-851 PC$4.00/MF$1.45
Institute of Nuclear Physics, Krakow (Poland).
TEMPERATURE SPIN-WAVE RENORMALIZATION IN CR SUB 2 O SUB 3 AND ALPHA --FE SUB 2 O SUB 3 .
Z. Dimitrijevic, A. Kowalska, A. M. Oles, K. Sokalski, and M. Krygowska. Sep 73, 8p

Descriptors: (*Chromium oxides, *Crystal lattices), (*Iron oxides, Crystal lattices), Bloch theory, Crystal structure, Diffraction methods, Dispersion relations, High temperature, Inelastic scattering, Low temperature, Magnons, Medium temperature, Neutrons, Spin waves, Temperature dependence.

For abstract, see NSA 29 12, number 31652.

IS-T-633 PC$9.00/MF$1.45
Ames Lab., Iowa (Usa).
LOW TEMPERATURE ABSORPTION SPECTRA AND ENERGY LEVELS OF HOF SUB 3 IN THE REGIONS 21625 CM EXP -1 TO 21360 CM EXP -1 AND 26160 CM EXP -1 TO 25900 CM EXP -1 .
D. R. Blinde. Apr 74, 120p
Contract W-7405-eng-82

Descriptors: (*Holmium fluorides, *Absorption spectra), Crystals, Electromagnetic radiation, Energy levels, Energy-level transitions, Group theory, Ions, Magnetic fields, Temperature dependence, Very low temperature, Visible radiation, Zeeman effect.

For abstract, see NSA 29 12, number 31643.

ITF-73-149-P PC$4.00/MF$1.45
An Ukrainskoj SSR, Kiev. Inst. Teoreticheskoj Fiziki.
ASYMPTOTIC PROPERTIES OF THE ISING MODEL WITH POSITIVE LONG-RANGE INTERACTION.
S. S. Lapushkin, and V. N. Plechko. 1973, 16p
In Russian.

Descriptors: (*Binary alloy systems, *Crystal structure), Asymptotic solutions, Atoms, Free energy, Interactions, Magnetic fields.

For abstract, see NSA 29 12, number 31600.

JUL-1035-FF PC$7.75/MF$1.45
Kernforschungsanlage Juelich G.M.B.H. (F.R. Germany). Inst. Fuer Festkoerperforschung.
DETERMINATION OF THE PHONON SPECTRUM FROM COHERENT INELASTIC NEUTRON SCATTERING BY POLYCRYSTALS.
N. Breuer. Dec 73, 95p

Descriptors: (*Phonons, *Spectra), (*Neutron beams, *Coherent scattering), (*Crystal lattices, Phonons), Analytical solution, Brillouin zones, Crystal models, Errors, Inelastic scattering, Polycrystals.

For abstract, see NSA 29 12, number 29969.

KFK-EXT-3/72-11 PC$7.75/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Experimentelle Kernphysik.

REPORT ON HIGH-FREQUENCY SUPERCONDUCTIVITY.
J. Halbritter. Oct 72, 115p
In German.

Descriptors: (*Cavity resonators, *Superconductors), Ghz range 01-100, Mhz range 100-1000, Superconductivity, Surface properties.

For abstract, see NSA 29 12, number 30662.

KFK-EXT-3-73-7 PC$5.50/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Experimentelle Kernphysik.
ELECTRON SINGLE PARTICLE STATES IN THE FLUXLINE LATTICE IN PURE TYPE-II-SUPERCONDUCTORS.
G. Ries. Jan 74, 47p
In German.

Descriptors: (*Type-ii superconductors, *Magnetic flux), Bcs theory, Crystal lattices, Eigenvalues, Energy gap.

For abstract, see NSA 29 12, number 30664.

KFK-1924 PC$7.25/MF$1.45
Kernforschungszentrum Karlsruhe (F.R. Germany). Inst. Fuer Radiochemie.
PHASE CONVERSION AND PHASE EQUILIBRIUM OF URANIUM--RARE EARTH MIXED OXIDES.
U. Wichmann. Feb 74, 81p
In German.

Descriptors: (*Uranium oxides, *Phase studies), (*Lanthanum oxides, Phase studies), (*Lutetium oxides, Phase studies), (*Holmium oxides, Phase studies), Erbium oxides, Europium oxides, Neodymium oxides, Phase diagrams, Thermodynamic properties, Thulium oxides, Uranates, Uranium dioxide, Ytterbium oxides.

For abstract, see NSA 29 12, number 30082.

KHFTI-73-22 PC$6.25/MF$1.45
An Ukrainskoj SSR, Kharkov. Fiziko-Tekhnicheskij Inst.
ELECTRONIC STRUCTURE AND PROPERTIES OF BERYLLIUM.
I. I. Papirov. 1973, 63p
In Russian.

Descriptors: (*Beryllium, *Electronic structure), Anisotropy, Chemical bonds, Comparative evaluations, Crystal lattices, Elasticity, Fermi level, Fractures, Mechanical properties, Peierls-nabarro force, Plasticity, Reviews, Slip.

For abstract, see NSA 29 12, number 30084.

PATENT-3 772 520 Not available NTIS
Department of the Air Force Washington D C
METHOD FOR THE INVESTIGATION OF THIN FILMS ON A SEMICONDUCTOR SUBSTRATE IN A SCANNING ELECTRON MICROSCOPE.
Patent,
Charles J. Varker. Filed 21 Mar 72, patented 13 Nov 73, 4p Rept nos. PAT-APPL-236 595,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Thin films, *Semiconducting films, *Test methods, *Patents, Electron microscopy, Secondary emission.
Identifiers: PAT-CL-250-307.

The patent describes a method of investigating thin films where the film is mounted on semiconductor substrate containing a p-n junction and the film is scanned with an electron beam. The resulting current produced at the p-n junction by the penetrating electrons modulates the brightness of an associated display tube.

RD/B/N-2756 PC$4.00/MF$1.45
Central Electricity Generating Board, Berkeley (Uk). Berkeley Nuclear Labs.
DIFFUSION OF MANGANESE IN TYPE 316 AUSTENITIC STAINLESS STEEL.
A. F. Smith, and R. Hales. Nov 73, 15p

Descriptors: (*Manganese, *Diffusion), (*Stainless steel-316, *Sorptive properties), Annealing, Crystal lattices, Electron probes, Manganese 54, Microanalysis, Tracer techniques.

For abstract, see NSA 29 12, number 30089.

SLA-73-7003 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
EXACT CALCULATION OF THE PHONON-ASSISTED JUMP RATE.
D. Emin. 1974, 5p CONF-740313-1

Descriptors: (*Solids, *Carrier mobility), Debye temperature, Electric conductivity, Electronic circuits, Impurities, Numerical solution, Phonons, Temperature dependence, Ultralow temperature.

For abstract, see NSA 29 12, number 31660.

UCID-16447 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
ENHANCED STRESS WAVES IN SOLIDS.
W. W. Wilcox. 11 Feb 74, 16p
Contract W-7405-eng-48

Descriptors: (*Aluminium, *Stresses), Laser radiation, Plates, Pulses, Rods.

For abstract, see NSA 29 12, number 31665.

UCLA-34-P-201-8 PC$4.75/MF$1.45
California Univ., Los Angeles (Usa). School of Engineering and Applied Science.
ENERGY WAVE NUMBER CHARACTERISTICS FOR CUBIC SYSTEMS WITH ANISOTROPIC LINEAR-EXPANSION-COEFFICIENT TENSOR. FIFTH TOPICAL PROGRESS REPORT, JANUARY 1--DECEMBER 31, 1973.
H. Yamauchi, and D. de Fontaine. Dec 73, 33p
UCLA-ENG-7398
Contract AT(04-3)-34

Descriptors: (*Iron, *Crystal defects), (*Nickel, Crystal defects), (*Copper, Crystal defects), Anisotropy, Crystal lattices, Cubic lattices, Elasticity, Energy, Fourier transformation, Impurities, Mathematical models, Matrices, Numerical solution, Tensors, Voids.

For abstract, see NSA 29 12, number 31616.

20M. Thermodynamics

AD-780 514/6GA PC$3.75/MF$1.45
Rome Air Development Center Griffiss AFB N Y
THEROS: A COMPUTER PROGRAM FOR HEAT FLOW ANALYSIS.
Final rept. Jan 73-Feb 74,
Thomas J. Rossiter. Apr 74, 52p Rept no. RADC-TR-74-113

Descriptors: *Heat transfer, *Computer programs, Heat sinks, Heat transmission, Thermal conductivity, Circuits, FORTRAN.
Identifiers: THEROS computer program, FORTRAN 5 programming language.

The report describes the use of a computer program called THEROS which is capable of performing a time dependent thermal analysis of relatively complex geometrical structures. The program is written in Fortran 5 and is available to all users of the RADC computer system. It is designed with the user in mind, requiring only a few, very simple instruction statements. Theros has fast computation time and can analyze two dimensional, multi-material structures having temperature dependent thermal conductivities. (Author)

PATENT-3 791 158 Not available NTIS
Department of the Air Force Washington D C
CRYOSORPTION PUMPING WITH FROST SORBENTS.
Patent,
Kenneth E. Tempelmeyer. Filed 23 Aug 72, patented 12 Feb 74, 8p Rept nos. PAT-APPL-283 023,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Cryopumping, *Patents, Sorption, Cryogenics, Frost, High vacuum, Gases, Molecular structure, Evacuation.
Identifiers: PAT-CL-62-55-5.

The patent describes a system for providing very high vacuums in closed vessels having a hydrogen, helium or neon gaseous atmosphere. The gaseous atmosphere is placed in communication with a cryogenically cooled frost coated structure. The frost is formed on the cooled surface by depositing a sorbent gas, such as carbon dioxide, sulfurdioxide or methyl chloride onto the surface under processing conditions that produce a disordered or amorphous frost structure. The formation technique utilized in forming the frost provides a structure that adsorbs hydrogen, helium or neon gas molecules as they come in contact with the frost surface to a degree not heretofore achieved. As a result, the hydrogen, helium or neon atmosphere is, in effect, pumped out of the closed vessel resulting in the production of a very high vacuum therein.

SLA-74-5230 PC$4.00/MF$1.45
Sandia Labs., Albuquerque, N.Mex. (Usa).
RADIAL AND CIRCUMFERENTIAL EQUILIBRATION OF A RADIANT ENERGY PULSE IN A CYLINDRICAL COMPOSITE.
W. P. Jr. Schimmel. 1973, 11p CONF-731106-5

Descriptors: (*Cylinders, *Thermal equilibrium), (*Thermal diffusion, *Analytical solution), Composite materials, Eigenvalues, Fuel elements, Heating, Pulses, Shields.

For abstract, see NSA 29 12, number 29245.

SRARI-P-200 PC$4.50/MF$1.45
Nauchno-Issledovatel'Skij Inst. Atomnykh Reaktorov, Dimitrovgrad (Ussr).
STABILITY AND MONOTONY RANGES FOR TWO-POINT DIFFERENCE SCHEMES OF THERMAL MASS TRANSFER EQUATION.
G. K. Antipin. 1972, 28p
In Russian.

Descriptors: Differential equations, Finite difference method, Mass transfer, Numerical solution, Temperature dependence.

For abstract, see NSA 29 12, number 29246.

WAPD-TM-1133 PC$4.50/MF$1.45
Bettis Atomic Power Lab., Pittsburgh, PA. (Usa).
DIRECT ITERATION METHOD FOR THE INCORPORATION OF PHASE CHANGE IN FINITE ELEMENT HEAT CONDUCTION PROGRAMS.
E. Friedman. Mar 74, 27p
Contract AT(36-1)-GEN-14

Descriptors: (*Transition heat, *Finite element method), (*Phase transformations, Transition heat), (*Metals, Transition heat), Heat transfer.

For abstract, see NSA 29 12, number 29247.

20N. Wave Propagation

AD-780 055/0GA PC$3.75/MF$1.45
Ohio State Univ Columbus Electroscience Lab
A NEW METHOD FOR COMBINING THE METHOD OF MOMENTS WITH THE GEOMETRICAL THEORY OF DIFFRACTION.
Technical rept.,
T. H. Newhouse, and G. A. Thiele. Mar 74, 60p
Rept no. ESL-3468-4
Contract N00014-67-A-0232-0018

Descriptors: *Antennas, *Electromagnetic scattering, *Diffraction, Integral equations, Maxwells equations, Matrices(Mathematics), Approximation, Theses.
Identifiers: *Method of moments, Geometrical optics.

A technique for combining moment methods with the geometrical theory of diffraction is presented which permits the solution of problems which cannot be practically solved by either method individually. The fundamental idea used to develop the hybrid technique is to modify the usual impedance matrix which characterizes, for example, a wire antenna such that a nearby metallic body or discontinuity on that body is properly accounted for. This modification is readily accomplished using the geometrical theory of diffraction and/or geometrical optics. Several example problems are considered to illustrate the usefulness of the technique. (Modified author abstract)

21. PROPULSION AND FUELS

21B. Combustion and Ignition

AD-779 805/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE BURNING OF AMMINE PERCHLORATES AND NITRATES OF COPPER (II) NICKEL (II) AND COBALT (III),
V. V. Gorbunov, A. A. Shidlovskii, and L. F. Shmazin. 19 Apr 74, 9p Rept no. FTD-HT-23-1217-74
Edited trans. of Fizika Goreniya i Vzryva (USSR) v7 n4 p607-609 Dec 71, by Ray E. Zarza.

Descriptors: *Burning rate, *Metal complexes, *Amines, Cobalt compounds, Nickel compounds, Copper compounds, Combustion, USSR, Translations, Pressure, Perchlorates, Nitrates.
Identifiers: Copper amine complexes.

The effect of pressure on the combustion rate of complex perchlorates and nitrates of copper, nickel and cobalt were studied using the general formula (M(+m)(NH3)x) Am where A = ClO4 or NO3 and x = 6, 4 or 2. The combustion rate of the salts under pressure to 100 atm in an atmosphere of nitrogen was determined.

AD-779 808/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
SOME FLAME STABILIZATION PROBLEMS,
A. M. Levin. 23 Apr 74, 17p Rept no. FTD-HT-23-871-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) n5 p59-68 1972, by Marilyn Olaechea.

Descriptors: *Flames, *Burners, Turbulent flow, Gas flow, Velocity, Stabilization, USSR, Translations.

AD-779 813/5GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECT OF ACOUSTIC VIBRATIONS ON TURBULANT BOUNDED FLAME,
Yu. Ya. Borisov, E. I. Rozenfeld, and V. G. Smolenskii. 23 Apr 74, 19p Rept no. FTD-HT-23-868-74
Edited trans. of Teoriya i Praktika Szhigeniya Gaza (USSR) n5 p42-53 1972, by Marilyn Olaechea.

Descriptors: *Flames, *Acoustic waves, Acoustic fields, Vibration, Turbulence, USSR, Translations.
Identifiers: Natural gas.

Acoustic vibrations or vibrations from a mechanical turbulizer imposed on a flame enables intensification of the gas combustion processes and regulation of the characteristics of the flame. However, at the present time there is no unified approach to the treatment of the physical principles of the effect of an acoustical field on a turbulent flame, and this can be explained basically by the limited amount of experimental data. The purpose of this article is to study the effect of acoustic vibrations on a bounded turbulent flame by analyzing concentration, temperature, velocity, and acoustic fields and the characteristics of turbulence within the volume of the furnace chamber. Studies were made under conditions close to the combustion of natural gas in industrial heat assemblies.

AD-780 334/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CONDITIONS OF FLAME TRANSFER AND FORMATION OF TEMPERATURE FIELDS IN MULTIBURNER COMBUSTION CHAMBERS OF JET-TYPE GTU,
G. N. Lyubchik, V. A. Khristich, Ya. S. Kainovskii, S. A. Gavrish, and V. N. Chmel.. 24 May 74, 12p Rept no. FTD-HT-23-882-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) v5 p316-321 1972, by Victor Mesenzeff.

Descriptors: *Gas turbines, *Combustion chambers, Flames, Burners, Gas flow, Jet flames, Translations, USSR.

AD-780 336/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
LENGTH OF A TURBULENT DIFFUSION COAXIAL FLAME IN A FURNACE CHAMBER,
B. S. Soroka, and A. E. Erinov. 23 May 74, 13p Rept no. FTD-HT-23-879-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) v5 p238-244 1972, by Frank C. Vaughan.

Descriptors: *Furnaces, Combustion, Flames, Diffusion, Turbulence, Translations, USSR.

AD-780 372/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
ON THE MECHANISM OF CATALYST ACTION ON THE COMBUSTION OF CONDENSED SYSTEMS,
O. P. Korobeinichev, A. M. Viktorenko, A. G. Tereshchenko, and N. N. Kolomeichuk. 24 May 74, 13p Rept no. FTD-HT-23-1222-74
Edited trans. of Fizika Goreniya i Vzryva (USSR) v8 n4 p511-517 Dec 72, by Catherine M. Barber.

Descriptors: *Combustion, *Catalysis, *Ammonium perchlorate, Microscopy, Surfaces, Polymethyl methacrylate, Burning rate, USSR, Translations.

The present work is devoted to the experimental investigation of the mechanism of catalyst action on the combustion of condensed systems using APC (ammonium perchlorate) as a base. In the work the authors give the results of the investigations of catalysis of the combustion of APC and of mixtures having it as a base by using an optical microscope and an electron scanning microscope, and also give the results of investigations of the effect of dispersion of a catalyst on the APC combustion rate and of a model APC and polymethylmethacrylate (PMMA) system.

AD-780 409/9GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
EFFECT OF THE PROPERTIES OF GAS FUEL ON THE OPERATION OF JET-STABILIZER BURNERS,
V. A. Khristich, and G. N. Lyubchik. 30 Apr 74, 16p Rept no. FTD-HT-23-877-74
Edited trans. of Teoriya i Praktika Szhiganiya Gaza (USSR) v5 p125-132 1972, by Rene E. Courville.

Descriptors: *Burners, *Jet flow, *Fuels, Turbulence, Propane, Methane, Hydrogen, USSR, Translations, Flames.

The article is devoted to studying the effect of the type of fuel used on the basic rules of operation of jet-stabilizer burners. The main studies were conducted on methane, hydrogen and propane.

AD-780 486/7GA Reprint
United Aircraft Research Labs East Hartford Conn
CHEMISTRY OF POLLUTANT FORMATION IN FLAMES,
Howard B. Palmer, and Daniel J. Seery. 1973, 31p
AFOSR-TR-74-0887
Contract F44620-69-C-0100
Prepared in cooperation with Pennsylvania State Univ., University Park. Dept. of Material Sciences.
Availability: Pub. in Annual Reviews on Physical Chemistry, v24 p235-262 1973.

Descriptors: *Combustion products, *Air pollution, Smoke, Reviews, Hydrocarbons, Nitrogen oxides, Reaction kinetics, Sulfur oxides, Carbon monoxide.
Identifiers: Chemical reaction mechanisms, Soot.

A review is presented of the recent literature related to the chemistry of air pollution from combustion systems. Emphasis is on oxides of nitrogen, oxides of sulfur, carbon monoxide, unburned hydrocarbons and soot. (204 references). (Author)

TT-74-50019 PC$9.25/MF$1.45
National Science Foundation, Washington, D.C.
THERMODYNAMIC AND THERMOPHYSICAL PROPERTIES OF COMBUSTION PRODUCTS. VOLUME COMPUTATION METHODS,
V. E. Alemasov, A. F. Dregalin, A. P. Tishin, and V. A. Khudyakov. 1974, 454p
Trans. of mono. Termodinamicheskie i Teplofizicheskie Svoistva Produktov Sgoraniya. Volume 1. Metody Rascheta, Moscow, 1971, by R. Kondor and Ch. Nisenbaum. Sponsored in part by National Science Foundation, Washington, D.C. Special Foreign Currency Science Information Program.

Descriptors: *Exhaust gases, *Combustion products, *Thermodynamic properties, Heat transfer coefficient, Viscosity, Equations of state, Entropy, Enthalpy, USSR, Translations, Specific heat, Temperature, Pressure, Flow rate, Chemical composition, Acoustic velocity, Thermodynamic equilibrium, Reviews, Computation, Propellants, Computer programming, Chemical equilibrium.

The first part discusses methods for preparing the initial data on propellants for calculating the thermodynamic and thermophysical properties of the combustion products. The second part describes the determination of ideal systems of combustion products, including methods for calculating the equilibrium composition, thermodynamic and thermophysical properties, characteristics of the processes of combustion and expansion, and

methods of extrapolation and interpolation of the results. The third part contains a description of the tabular and graphic presentation of the results of the calculation of ideal systems of combustion products. The fourth part gives an analysis of the properties of real systems of combustion products, and of the influence of these properties on the basic characteristics of the systems. The fifth part contains handbook data, coefficients of approximating polynomials, and data on their errors.

21D. Fuels

AD-779 895/2GA PC$9.75/MF$1.45
Purdue Univ Lafayette Ind School of Mechanical Engineering
STUDIES OF SLURRY FUELED PROPULSION SYSTEMS.
Final progress rept. Sep 70-Jan 73,
Harry M. Carbone, and Bruce A. Reese. Jan 74, 131p Rept no. TM-74-4
Contract N00014-67-A-0226-0013
See also AD-770 041.

Descriptors: *Slurry fuels, *Ramjet engines, *Alumina, Combustion chambers, Combustion, Burning rate, Thermochemistry, Temperature, Efficiency, Boron.
Identifiers: *Aluminized slurry fuels, Decalin, Naphthalene/tetrahydro, JP-4 fuel, JP-5 fuel, Fuel air ratios.

The study has been conducted to test performances of various specific fuels, both high energy hydrocarbon and slurry fuels, in a sudden dump ramjet combustor and determine the effects of design variables of the combustor on fuel performance. In particular, the combustion efficiencies (determined from measured thrust rises) of specific fuels in the various sudden dump ramjet combustor are presented as a function of equivalence ratio. A description of the facility used in the data acquisition process is presented. The results of the various fuels and the effects of the design variables of the combustor are then presented and discussed. Also presented are the studies performed in the areas of flame visualization and flow visualization. These studies were initiated with the objectives of obtaining insight into the fluid mechanics and effects of design variables of the sudden dump ramjet combustor. (Modified author abstract)

AD-779 995/8GA PC$5.00/MF$1.45
Army War Coll Carlisle Barracks Pa
THE NAVAL PETROLEUM RESERVES AND THEIR RELEVANCY IN THE DECADE 1975-1985. (ARE THE 'OTHER' NAVAL RESERVES NECESSARY).
Student essay,
John K. Teel. 15 Oct 73, 38p

Descriptors: *Petroleum products, *Navy, *Oils, Reserve equipment, Economics, Costs, Production, Commerce.
Identifiers: *Naval petroleum reserves, Economic analysis, Energy consumption, Shale oil, Imports.

In 1912 President Taft established two Naval Petroleum Reserves '...to reserve certain fuel oil deposits for the use of the American Navy'. A third was established by President Wilson in 1915, and a fourth was added by President Harding in 1923. Naval Oil Shale Reserves 1 and 2 were designated in 1916 and No. 3, in 1924. For the most part, these land set-asides are in a standby status (Reserves Nos. 1, 3 and 4), about exhausted (Reserve no. 2), or undeveloped (Naval Shale Oil Reserves Nos. 1, 2 and 3). The report examines the present domestic available-energy deficiency and concludes that petroleum is the only energy source that can be stretched sufficiently to cover the widening gap in supply and demand. Since crude oil imports must fill this gap, at least for the next decade, the economics and strategic aspects of this dependence are discussed. (Modified author abstract)

COM-74-50529/8GA Not available NTIS
National Bureau of Standards, Washington, D.C.
LNG MEASUREMENT PROJECTS AT NBS.
Final rept.,
James A. Brennan. 1974, 2p
Pub. in Proceedings of Int. School of Hydrocarbon Measurement (49th), Norman, Okla., 16-18 Apr 74 p464-465 1974.

Descriptors: *Liquefied natural gas, Cryogenics.
Identifiers: Scientific research.

The paper presents, in summary form, the projects at the Cryogenics Division of NBS involved with LNG or LNG related measurements. A brief description of each project is given along with identification of the sponsoring agency.

PB-232 489/5GA PC$3.75/MF$1.45
Federal Energy Office, Washington, D.C. Office of Energy Analysis.
NATIONAL PETROLEUM SUPPLY AND DEMAND, 1974. POST-EMBARGO.
Technical rept.
26 Apr 74, 56p* FEO-EATR-74-2

Descriptors: *Petroleum products, *Economic forecasting, Supply(Economics), Demand(Economics), Estimates, Crude oil, Gasoline, Fuel oil, Residual oils, Jet engine fuels, Liquefied petroleum gases, Liquefied natural gas, Petrochemistry, Oil recovery, International trade, Inventories.

The report is outlined as follows: Section II presents an overview of how the forecasts are conducted. Section III outlines the assumuptions underlying the estimation of petroleum product supply. Section IV outlines the assumptions and estimating relationships for petroleum product demand. Section V presents the results of implementing the forecasting model under two scenarios which take the lifted embargo into account and distinguish between two estimates of demand. Appendices present an outline of the simulation model itself and the data files which support the forecasts presented in Section V.

UCID-16094 PC$5.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
THERMODYNAMIC EQUILIBRIA FOR WYOMING COAL.
D. R. Stephens. 4 Aug 72, 39p
Contract W-7405-eng-48

Descriptors: (*Coal, *Gasification), Chemical composition, High temperature, Methane, Production, Thermal equilibrium, Very high temperature, Wyoming.

For abstract, see NSA 29 12, number 31485.

UCID-16155 PC$4.00/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
THERMAL WAVE PROPAGATION MODELS FOR IN SITU COAL GASIFICATION.
A. E. Sherwood. 27 Oct 72, 20p
Contract W-7405-eng-48

Descriptors: (*Coal, *Gasification), Coal deposits, Explosives, Methane, Numerical solution, Steam, Velocity, Wave propagation.

For abstract, see NSA 29 12, number 31486.

UCRL-75494 PC$4.50/MF$1.45
California Univ., Livermore (Usa). Lawrence Livermore Lab.
IN-SITU COAL GASIFICATION.
D. R. Stephens. 31 Jan 74, 30p CONF-740118-1

Descriptors: (*Coal, *Gasification), Boreholes, Charges, Chemical explosives, Comparative evaluations, Efficiency, Explosions, Fractures, Mining, Production, Underground, Usa, Ussr.

For abstract, see NSA 29 12, number 31491.

21E. Jet and Gas Turbine Engines

AD-164 645/4GA Not available NTIS
Department of the Air Force Washington D C
TURBINE BLADE MANUFACTURED OF SELF-CARRYING LAMINATES.
Patent,
Wayne A. Tall. Filed 27 Jun 72, patented 25 Dec 73, 5p
Contracts PAT-APPL-266 810, PATENT-3 781 130
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Turbine blades, *Patents, Laminates, Bonding, Cooling, Fabrication.
Identifiers: PAT-CL-416-97.

The patent relates to a turbine blade manufactured from a series of laminates each oriented in a radial-tangential plane for carrying its own centrifugal loads. The laminates are partially performed by being initially cut into a shape suitable for stacking and bonding and being further perforated along boundaries outlining the final blade shape desired for facilitating the machine removal of excess material. Additional perforations are also incorporated in each laminate for outlining a series of built-in coolant passages.

AD-779 804/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
THE EFFECT OF DELIVERY OF COOLING AIR TO THE RING CLEARANCE ON THE EFFICIENCY AND DISCHARGE CHARACTERISTIC OF A TURBINE STAGE,
F. S. Bedcher, and L. M. Ronkin. 13 Apr 74, 10p Rept no. FTD-HT-23-1194-74
Edited trans. of Energomashinostroenie (USSR) n9 p46-46 1971, by Robert Allen Potts.

Descriptors: *Gas turbines, *Air cooled, Cooling, Gas turbine nozzles, Gas turbine blades, Aerodynamic characteristics, Translations, USSR.

AD-779 834/1GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
BLADE BREAK INDICATOR FOR A TURBOMACHINE,
I. E. Zablotskii, and Yu. A. Korostelev. 18 Apr 74, 60p Rept no. FTD-HT-23-1193-74
Edited trans. of Energomashinostroenie (USSR) n7 p36 1971, by Joseph E. Pearson.

Descriptors: *Turbomachinery, *Turbine blades, Failure, Monitors, Rotor blades, Instrumentation, Translations, USSR.

AD-779 958/8GA PC$3.25/MF$1.45
Army Aviation Systems Command St Louis Mo
MAJOR ITEM SPECIAL STUDY (MISS), CH-47A GAS TURBINE ENGINE (T55-L-7C).
Interim rept. 1 Jan 64-1 Jul 73.
May 74, 22p Rept no. USAAVSCOM-TR-74-28

Descriptors: *Gas turbines, *Helicopters, *Helicopter engines, *Value engineering, Logistics support, Quality control, Spare parts, Maintainability, Cost analysis, Failure.
Identifiers: MISS(Major Item Special Studies), Major item special studies, H-47 aircraft, CH-47A aircraft, T-55 engines, T-55L7C engines, *Logistics management.

Major Item Special Study (MISS) reports are performed on DA Form 2410 reportable components. These are time change items and certain condition change items selected because of high cost or need for intensive management. Basically, the MISS reports are concerned with analyzing reported

removal data presented in the Major Item Removal Frequency (MIRF) report. The failure modes reported for each removal are examined and grouped into categories which are intended to clarify the intent of the data reporting. From this data, removal distribution can be plotted and an MTR (mean time to removal) can be calculated. The MISS reports then investigate possible cost savings based on total elimination of selected failure modes. These modes are chosen because of the percentage of failures they represent and/or because they appear to be feasible Product Improvement Program (PIP) areas. (Author)

AD-780 152/5GA PC$11.50/MF$1.45
Teledyne Cae Toledo Ohio
ADVANCED SMALL AXIAL TURBINE TECHNOLOGY PROGRAM.
Test rept., 1 Oct 72-20 Dec 73 on Phase 2,
Hans F. Due, and Casimir Rogo. Feb 74, 167p
Rept no. TCAE-1329
Contract DAAJ02-72-C-0117

Descriptors: *Gas turbines, Cascade structures, Turbine parts, Aerodynamics, Cold flow, Experimental design.
Identifiers: *Small gas turbines.

The report presents the Phase II experimental investigations of the Phase I turbine design aerodynamics accomplished using a non-rotating, annular sector cascade. Phase II is the second phase of a five-phase thirty-one month program. The overall program is arranged to isolate the variables which affect turbine flow, and to develop both empirical data and design judgment criteria which can be incorporated into isolate the variables which affect turbine flow, and to develop both empirical data and design judgment criteria which can be incorporated into the design technique to improve the accuracy of predicting losses, flow conditions, velocity triangles and design point matching. (Modified author abstract)

AD-780 317/4GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
HYPERSONIC FLOW AROUND A SOLID OF REVOLUTION ON WHICH A FANNED JET IS INJECTED,
M. I. Lerman. 30 Apr 74, 14p Rept no. FTD-HT-23-715-74
Edited trans. of Leningrad Univ. Vestnik (USSR) v27 n7 Seriya Matematika, Mekhanika, i Astronomii, n2 p96-101 Apr 72, by Victor Mesenzeff.

Descriptors: *Jet engines, *Fans, Hypersonic flow, Jets, Aerodynamic forces, Gas dynamics, Translations, USSR.

AD-780 365/3GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CONTACTLESS MEASURING OF VIBRATIONS IN THE ROTOR BLADES OF TURBINES,
I. E. Zablotskii, Yu. A. Korostelev, and L. B. Sviblov. 23 Apr 74, 24p
Edited trans of Lopatochnye Mashiny i Struynye Apparaty (USSR) n6 p106-121 1972, by Marilyn Olaechea.

Descriptors: *Gas turbines, *Rotor blades(Turbomachinery), Vibration, Cathode ray tubes, Measurement, Resonant frequency, Translations, USSR.

AD-780 376/0GA PC$3.00/MF$1.45
Foreign Technology Div Wright-Patterson AFB Ohio
CHARACTERISTICS OF DIFFUSERS IN SHOCK TUBE,
V. M. Anufriev, G. I. Kozlov, and D. K. Roitenburg. 23 Apr 74, 14p Rept no. FTD-HT-23-1976-74
Edited trans. of Akademiya Nauk SSSR. Izvestiya. Mekhanika Zhidkosti i Gaza, n1 p156-161 Jan/Feb 72, by Marilyn Olaechea.

Descriptors: *Diffusers, Shock tubes, Gas flow, Nozzle area ratio, Translations, USSR.

A study was done on diffuser starting in a shock tube at M=8 at variable Re numbers, and the throttling characteristics were recorded.

AD-780 467/7GA PC$3.25/MF$1.45
Stevens Inst of Tech Hoboken N J Dept of Mechanical Engineering
RESEARCH ON THE FLUTTER OF AXIAL-TURBOMACHINE BLADING.
Technical rept.,
Fernando Sisto, and Ron Ho Ni. May 74, 31p Rept no. ME-RT-740008
Contract N00014-67-A-0202-0016

Descriptors: *Turbomachinery, *Aeroelasticity, Cascade structures, Flutter, Vibration, Compressible flow, Turbine blades, Numerical analysis.

The 'time marching' technique is successfully applied to the numerical computation of the nonstationary aerodynamics of a flat plate cascade for compressible flow of either subsonic or supersonic nature. The unsteady perturbation amplitudes of fluid properties are used as the dependent variables so that the computational domain can be reduced to a two-dimensional channel guided by two adjacent blades for any inter-blade phase angle. A new method of handling the boundary condition is developed with which the order of accuracy for the boundary points will be the same as for the interior points. The wake region behind the trailing edge of each blade in cascade is treated as a 'slip plane' as in two dimensional steady state supersonic flow. Results are in good agreement with existing solutions. (Author)

PATENT-3 769 797 Not available NTIS
Department of the Air Force Washington D C
BY-PASS ENGINE HAVING A SINGLE, THRUST DIVERTER VALVE MECHANISM FOR A V/STOL AIRCRAFT.
Patent,
Emerson W. Stevens. Filed 28 Oct 71, patented 6 Nov 73, 5p Rept nos. PAT-APPL-193 436,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Bypass engines, *Bypass valves, *Patents, Short takeoff aircraft, Jet engines, Fluid flow, Diverting.
Identifiers: *PAT-CL-60-226-R.

The patent relates to a thrust diverter valve assembly for a bypass engine including flap elements pivotally mounted for alternate adjustments between a first position diverting bypass flow to a straight-through passage. A second position diverts the bypass flow to a vertical-takeoff-and-landing mode of operation. Hinged sections provide sealing between adjacent flap elements, and serve as flow-straightening vanes when the flap elements have been adjusted to their vertical flight mode.

PATENT-3 775 763 Not available NTIS
Department of the Air Force Washington D C
APPARATUS FOR INDICATING THE IMPENDING FAILURE OF A JET ENGINE.
Patent,
Robert P. Couch, Dennis R. Rossbach, and Robert A. Vopalensky. Filed 7 Mar 72, patented 27 Nov 73, 5p Rept nos. PAT-APPL-232 403,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Jet engines, *Warning systems, *Patents, *Electrostatic probes, Signal processing, Noise analyzers, Ionic current.
Identifiers: PAT-CL-340-236, *Aircraft onboard checkout systems.

The patent relates to an apparatus, for indicating impending failure of jet engines. It provides an electrostatic probe in the exhaust of the jet engine with the probe signal being applied to a circuit for providing pulses, at the amplitude of a signal in a sample and hold circuit, for each positive going signal followed by a negative going signal. A pulse height discriminator provides uniform output pulses, for each pulse exceeding the integrated engine noise level, and applies its output to a smoothing circuit. When the signal level in the smoothing circuit exceeds a predetermined level, a trigger circuit is operated to energize a warning circuit.

21F. Nuclear Propulsion

CNLM-3160 PC$4.25/MF$1.45
Pratt and Whitney Aircraft, Middletown, Conn. (Usa).
FUELED BEO FOR NUCLEAR REACTORS.
E. R. Dytko, and R. M. Kuhns. 25 Nov 60, 23p
Contract AT(11-1)-229

Descriptors: (*Aircraft propulsion reactors, *Fuel pins), (*Liquid metal cooled reactors, Fuel pins), (*Uranium dioxide, *Physical radiation effects), (*Beryllium oxides, Physical radiation effects), Irradiation, Lithium, Performance.

For abstract, see NSA 29 12, number 29978.

LA-3196 PC$3.75/MF$1.45
Los Alamos Scientific Lab., N.Mex. (Usa).
NEW INSTRUMENT FOR URANIUM DETERMINATION IN ROVER FUEL ELEMENTS: EIGHT-INCH AND TWENTY-FOUR-INCH MODELS.
G. M. Matlack, and C. F. Metz. 1 Dec 64, 33p
Contract W-7405-eng-36

Descriptors: (*Space propulsion reactors, Fuel elements), (*Fuel elements, *Nondestructive analysis), (*Uranium, Nondestructive analysis), Measuring instruments, Scintillation counters.

For abstract, see NSA 29 12, number 29611.

21G. Reciprocating Engines

AD-780 175/6GA PC$4.00/MF$1.45
Southwest Research Inst San Antonio Tex Army Fuels and Lubricants Research Lab
DIRECT WATER INJECTION COOLING FOR MILITARY ENGINES.
Final rept. Nov 72-Dec 73,
R. D. Quillian, Jr., S. J. Lestz, and R. B. Melton, Jr. Mar 74, 78p Rept no. AFIRL-32
Contract DAAD05-72-C-0053

Descriptors: *Diesel engines, *Water cooling, *Water injection, Thermodynamic cycles, Fuel systems, Exhaust gases, Emission.

This work was performed to provide information on a number of aspects related to direct water injection for total cooling of diesel engines. Based on tests using a single-cylinder CLR (Labeco) engine, the following determinations have been made: Water-injection total cooling can be accomplished over a very wide range of parameters; including injection timing; spray patterning, speed, and fuel rate. Port injection or even port induction of liquid can be used. Under some few conditions, only partial cooling is possible. Results show total cooling by direct water injection can be accomplished with increased power and better BSFC. (Modified author abstract)

PB-232 773/2GA PC$7.50/MF$1.45
Calspan Corp., Buffalo, N.Y.
TECHNICAL EVALUATION OF EMISSION CONTROL APPROACHES AND ECONOMICS OF EMISSION REDUCTION REQUIREMENTS

FOR VEHICLES BETWEEN 6,000 AND 14,000 POUNDS GVW,
L. Bogdan, A. Burke, and H. Reif. Nov 73, 344p*
EPA-460/3-73-005
Contract EPA-68-01-0463

Descriptors: *Air pollution, *Motor vehicles, *Exhaust gases, Weight(Mass), Gasoline engines, Diesel engines, Motor trucks, Hydrocarbons, Nitrogen oxides, Carbon monoxide, Computerized simulation, Cost estimates, Performance, Operating costs, Computer programs, Air pollution control equipment, FORTRAN.
Identifiers: Diesel engine exhaust, Medium duty vehicles, Catalytic reactors(Exhaust systems), Exhaust gas recirculation systems, *Air pollution control, *Pickup trucks, Thermal reactors, CVCC engines.

An account is presented of a two-part study concerned with the reduction of emissions from the group of vehicles populating the 6,000-14,000 pound GVW range. In the technical evaluation study, state-of-the-art control technology is used to synthesize control system strategies and to estimate their control effectiveness when applied to this class of vehicles. The economic analysis study develops the relationships between the different control strategies and the costs associated with their implementation. A description is given of a computer program developed to assess the impact on emissions and to evaluate implementation costs of the several control strategies. Numerical results are presented.

21H. Rocket Motors and Engines

PATENT-3 780 533 Not available NTIS
Department of the Air Force Washington D C
COMPOSITE WALL FOR A REGENERATIVELY COOLED THRUST CHAMBER OF A LIQUID PROPELLANT ROCKET ENGINE.
Patent,
David H. Huang. Filed 17 May 72, patented 25 Dec 73, 9p Rept nos. PAT-APPL-254 139,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Liquid propellant rocket engines, *Thrust chambers, *Patents, Regenerative cooling, Fabrication, Structural members.
Identifiers: PAT-CL-60-260.

The patent relates to a composite wall, and a method of manufacturing it, for a regeneratively cooled thrust chamber of a liquid propellant rocket engine. The composite wall of the thrust chamber comprises an outer wall component of high strength lightweight alloy, a middle wall component of nickel abutting with and joined to the outer wall component, and, an inner wall component of material of high thermal conductivity and high temperature strength and ductility, with the inner wall component abutting with and joined to the lands on the middle wall component.

PATENT-3 780 952 Not available NTIS
Department of the Air Force Washington D C
TENSION BRAZED FACE INJECTOR.
Patent,
David H. Huang. Filed 17 May 72, patented 25 Dec 73, 7p Rept nos. PAT-APPL-254 140,
Government-owned invention available for licensing. Copy of patent available Commissioner of Patents, Washington, D.C. 20231 $0.50.

Descriptors: *Liquid propellant rocket engines, *Injectors, *Brazing, *Patents, Fabrication, Metal joints, Manufacturing.
Identifiers: PAT-CL-239-424-5, *Tension brazing.

The patent relates to an injector for a liquid propellant rocket engine and a method of manufacturing the injector. The injector comprises a body structure portion of high strength, lightweight alloy to which is tension brazed a faceplate portion of nickel at each of the joints formed at the body structure-faceplate interface. Each brazed joint is divided by a purge groove.

21I. Rocket Propellants

AD-779 817/6GA PC$5.50/MF$1.45
Thiokol Corp Brigham City Utah Wasatch Div
DEVELOPMENT OF HTPB PROPELLANT FOR BALLISTIC MISSILES.
Quarterly progress rept. no. 8, Jan-Mar 74,
Grant Thompson, and Even E. Day. 11 Apr 74, 47p
Rept no. TWR-74249 AFRPL-TR-74-20
Contract F04611-72-C-0048
Report on Hydroxyl Terminated Polybutadiene Propellant.

Descriptors: *Solid rocket propellants, *Combustion, *Polybutadiene, Stress strain relations, Aging(Materials), Pressure, Tensile properties, Test equipment.

The program objective is to develop a family of solid propellants based on HTPB (hydroxyl terminated polybutadiene) binder, and demonstrate one optimized propellant formulation by large scale motor testing. Phase I data on DL-H271, an analog of TP-H1136, showed exceptionally fine structural properties after 27 months of aging at 75 and 135F. Additional data is presented for Phase II aging. The TU775/03 structural test vehicle was instrumented and cast with TP-H1139 propellant. (Author)

AD-779 915/8GA PC$15.25/MF$1.45
TRW Systems Group Redondo Beach Calif
DEVELOPMENT OF A ZERO-G GAUGING SYSTEM. VOLUME I.
Final rept. 16 Jun 72-20 Dec 73,
Frank E. Bupp. Jan 74, 244p Rept no. 16740-6003RU-00 AFRPL-TR-74-5
Contract F04611-71-C-0010

Descriptors: *Space shuttles, *Liquid rocket propellants, *Weightlessness, *Liquid level gages, Gamma rays, Detectors, Propellant tanks, Propellant control, Reliability(Electronics).

Nucleonic techniques using continual gamma-ray emission phenomena were extensively analyzed in the application of gauging (storable) propellants in the Space Shuttle Vehicle Orbital Maneuvering System (OMS) tanks when under zero-gravity conditions. Parametric analyses were used to identify viable gauging concepts which were, in turn, subjected to subsystem and engineering tradeoffs. Based on these tradeoffs, a flight-type nucleonic gauging system was designed, fabricated and tested. (Modified author abstract)

AD-780 219/2GA PC$3.25/MF$1.45
Naval Postgraduate School Monterey Calif
NATURAL FREQUENCIES OF BONDED AND UNBONDED PROPELLANTS IN THREE AND FIVE-INCH ROCKET MOTORS.
Interim rept. Apr-Jun 73,
Robert E. Ball. 16 May 74, 27p Rept no. NPS-55Bp74051

Descriptors: *Solid rocket propellants, *Dynamic response, Gun launchers, Resonant frequency, Rockets, Rocket engine cases, Bonding, Computer programs.

The results of an analysis by Armenakas for the natural frequencies of composite (two material) cylinders is used to determine the lowest natural frequency of bonded and unbonded propellants in three-inch and five-inch rocket motors. The lowest frequency is found to be approximately eight times larger than the lowest frequency in the launch force pulse. Thus, the dynamic effects in the propellant will be significant. (Author)

COM-74-11076/8GA PC$8.00/MF$1.45
National Bureau of Standards, Boulder, Colo. Cryogenics Div.
STUDY OF CRYOGENIC PROPELLANT SYSTEMS FOR LOADING THE SPACE SHUTTLE.
Interim rept.,
R. O. Voth, W. G. Steward, and W. J. Hall. Apr 74, 96p NBSIR-74-366
Contract NASA-CC-03420A

Descriptors: *Rendezvous spacecraft, *Cryogenic rocket propellants, *Propellant transfer, Propellant handling, Cryogenics, Unsteady flow, Surges, Water hammer, Input output devices(Computers).
Identifiers: *Space shuttles.

Computer programs have been written to model the liquid oxygen loading system for the space shuttle. The programs allow selection of input data through graphic displays which schematically depict the part of the system being modeled. The computed output is also displayed in the form of graphs and printed messages. Any one of six computation options may be selected. The first four of these pertain to thermal stresses, pressure surges, cooldown times, flow rates and pressures during cooldown. Options five and six deal with possible water hammer effects due to closing of valves, steady flow and transient response to changes in operating conditions after cooldown. Proceedures are given for operation of the graphic display unit and minicomputer.

22. SPACE TECHNOLOGY

22A. Astronautics

JPRS-62083 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
COSMONAUT FLIGHT PREPARATION,
A. Nikolaev. 24 May 74, 20p
Trans. of Krylya Rodiny (USSR) n2 p10-14 Feb 74, n3 p10-13 Mar 74.

Descriptors: *Astronauts, *Personnel development, Training simulators, Pilots(Personnel), Physical fitness, Manned spacecraft, Translations, USSR.
Identifiers: Soyuz spacecraft.

The report contains replies to questions on cosmonaut training and the design and layout of the Soyuz ship.

JPRS-62084 PC$3.00/MF$1.45
Joint Publications Research Service, Arlington, Va.
SPACECRAFT NAVIGATION ON INTERPLANETARY TRAJECTORIES,
M. Borisov. 24 May 74, 10p
Trans. from Krasnaya Zvezda (USSR) p4, 2 Apr 74.

Descriptors: *Mars probes, *Space navigation, Spacecraft trajectories, Interplanetary trajectories, Spacecraft maneuvers, Ground support equipment, Translations, USSR.

The report contains a discussion of flight of the Mars interplanetary station.

22C. Spacecraft Trajectories and Reentry

AD-779 918/2GA PC$4.00/MF$1.45
Massachusetts Inst of Tech Lexington Lincoln Lab
TRACKING ERROR ANALYSIS FOR SATELLITE SURVEILLANCE SYSTEMS.
Technical note,
Chester J. Kurys, and William J. Steinway. 29 Apr 74, 98p Rept no. TN-1974-28 ESD-TR-74-168
Contract F19628-73-C-0002, ARPA Order-600

Descriptors: *Satellites(Artificial), *Satellite tracking systems, *Orbits, Radar tracking, Optical tracking, Curve fitting, Graphics, Extrapolation.
Identifiers: Molniya satellites.

The problem of determining preliminary orbit parameters of a previously unobserved satellite using several types of postulated space surveillance systems has been investigated. The space surveillance systems used in ths analysis are ground-based (single-and dual-telescope systems), two ground-based radar system each with a different capability, and a satellite-borne tracking sensor. The Non-Real-Time Precision Orbit Determination (NRTPOD) Program was used as the analysis tool. The study is restricted to satellites whose perigee altitude is above 7500 km. An analysis of a typical Molniya orbit is included as a special case. The capabilities of each sensor system are studied for specific orbits. (Author)

REPORT LOCATOR LIST

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All of the reports announced in this issue are indexed by corporate author, subject, personal author, contract number, and accession/report number in the companion index **Volume 74, Number 16.**

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